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Abstract: An examination of the information behaviour of distance learning students is described, based on a case study of the International Programmes of the University of London. A comprehensive literature analysis, and comparison of relevant information behaviour models is carried out, supported by a survey of student behaviour. Following a pilot study, a main survey gained responses from 649 students, in 81 countries and following diverse study programmes. A variety of inter-related factors were found to influence information behaviour, level and subject of study being most significant. Ease and speed of access, and familiarity of sources are predominant factors. An extension of Wilson's information behaviour model is proposed to cater for the specific features of the distance learning context.

The Information Seeking Behaviour of Distance Learners: a Case Study of the University of London International Programmes

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Abstract

An examination of the information behaviour of distance learning students is described, based on a case study of the International Programmes of the University of London. A comprehensive literature analysis, and comparison of relevant information behaviour models was carried out, supported by a survey of student behaviour. Following a pilot study, a main survey gained responses from 649 students, in 81 countries and following diverse study programmes. A variety of inter-related factors were found to influence information behaviour, level and subject of study being most significant. Ease and speed of access, and familiarity of sources were predominant factors. An extension of Wilson’s information behaviour model is proposed to cater for the specific features of the distance learning context.

Keywords

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Introduction

The purpose of the study reported here was to gain an understanding of the information needs and information-seeking behaviour of distance learners, using the students of the International Programmes of the University of London as a case study.

Although much research has examined the information-related behaviour of students (Case, 2012), few studies have focused on distance learners. No previous study has looked at the information-seeking behaviour of a large constituency of distance learners who are distributed across several continents, and who predominantly depend on an online library at their host institution.

This gap in research may have arisen because information provision for distance learning has been considered an adjunct to the dominant provision by libraries to student communities primarily based on campus. The increase in scale and diversity of the student community, the importance of distance learning for access to education, and the economic importance of distance learning to higher education institutions necessitate the consideration of information provision for distance learning students as a subject for research.

The rapid growth of distance learning, and the particular nature of library and information provision to distance learners in such a situation, warrant such a study. In the UK alone, whereas before 1990 only the Open University and the University of London External System offered any form of formal distance learning, by 1998 over half of UK universities offered such provision (Unwin, Stephens and Bolton, 1997). Enrolment figures for institutions concentrating on distance learning have demonstrated large worldwide growth in recent years.

London University is one of longest-established of such institutions. Since 1858, students worldwide have been able to gain a University of London award without the requirement to attend a College (Kenyon Jones, 2008). Today the University of London has more than 50,000 students from more than 180 countries registered on its distance learning programmes. These programmes have expanded significantly since the early 1990s, student numbers rising by almost 40 per cent, and the range of programmes offered increasing fivefold (Quality Assurance Agency, 2005). The Quality Assurance Agency (2011) commented that “[this] diverse student body may be considered 'non-traditional' as it includes students in poorer and developing countries, mature learners, those with special needs due to disability, or geographic, economic, environmental, professional and social factors, and those with limited educational opportunities”.

The study reported here sought to extend the limited body of knowledge in this area by undertaking an information behaviour study of a large and representative sample of widely dispersed distance learners. The research was further aimed at developing a set of recommendations for effectively supporting the library and information needs of distance learners in the digital age. The research was carried out for a doctoral thesis, in which fuller details of all aspects are given (Tury, 2014).

Objectives and research questions

In order to meet these general aims of the study, six more specific objectives were identified:

- to identify the information needs of distance learners.
- to establish how the information needs of distance learners are met.
- to identify the challenges or barriers distance learners face when seeking, accessing, and using information sources and channels during the course of their studies.
- to establish the extent to which the information needs of the distance learners are met by the University of London's current Online Library provision.
- to explore what solutions can be employed to help distance learners overcome barriers to information access and use, and hence improve their learning experience.
- to make recommendations for better meeting the information needs of distance learning students.

These objectives were translated into five research questions:

- what are the information needs of distance learners at the University of London?
- what kind of information sources and information channels are used by distance learners and why they are used?
- what barriers do distance learners encounter when accessing and using Online Library resources?
- to what extent does the Online Library meet distance learners' information needs?
- what practical solutions can be employed to help learners overcome the barriers they face when seeking, accessing and using information sources?

In order to answer these questions, a detailed literature analysis was carried out, to identify all studies addressing specifically the information behaviour of distance learners. The results of this analysis were then combined with a comparison of information behaviour models, to give a conceptual basis for the study. From this, and the research questions, a series of hypotheses were generated, to be tested empirically in the University of London context.

Literature analysis

Relevant literature was identified by searches of Library and Information Science Abstracts, Library and Information Science and Technology Abstracts, and Web of Science, by following references and citations, and by scanning relevant journals and reviews. The intention was to be as comprehensive as possible in identifying items dealing specifically with the information behaviour of distance learners, and to be selective in dealing with the broader context.

Distance learners and library services

Distance learning offers important overall advantages to learners and to educational institutions. It enables education providers with limited resources to increase their student populations without necessarily investing in physical facilities, and allows learners to access any course, local or remote. However, there also disadvantages to distance learning in relation to information needs, which need to be taken into account in weighing its value and appropriateness and in assessing possible changes to ameliorate those difficulties. The main problem areas for learners include: lack of time; limited access to crucial support networks such as peers, tutors and librarians; delayed feedback; and technology which can fail, is often expensive to implement and often requires specialized skills to be used effectively. The provision of distance education has significant implications for library services, and there is a growing body of literature on how academic libraries have adapted their services to accommodate distance learners. For reviews and examples of this developing perspective, see, Lebowitz (1997), Unwin (1994, 1998), Beagle (2000), Ball (2003), Tang (2009), Raraigh-Hopper (2010), Hensley and Miller (2010), Shell et al. (2010), Lockerby and Stillwell (2010), Herring (2010), Iyer (2012) and Oladokun (2014).

Among the particular issues addressed have been: the need to foster the idea of 'library as place' for the distance student who may never visit the physical library (Coonin, Williams and Steiner, 2011); document delivery for remote users (Murphy, Franklin and Raia, 2007; Renner, Vardaman and Norton, 2007); the promotion of awareness of services among distant users (Davis, 2007); an 'outreach librarian' role for such students (Holloway, 2011); the use of standards to demonstrate quality of library services to distance students (Lewis, 2011); the need for specific training for library staff supporting distance learners (Cassner and Adams, 2012; Walsh, 2010); and the skills required of librarians supporting distance learners (Tang, 2013; Rebmann, Molitor and Rainey, 2012).

Information Behaviour of Distance Learners

The information behaviour of students has been one of the most studied topics within the whole information behaviour, giving much empirical data, and suggesting new models; see, for example, Case (2012), Catelano (2013), Al-Muomen, Morris and Maynard (2012), Grace (2008) and Urquhart and Rowley (2007).

Relatively little attention has been paid to the behaviour of distance learners specifically, although some authors have commented on the particular issues affecting them. An early example was the study by Unwin, Stephens and Bolton (1997), which looked at the library needs and expectations of 1000 UK-based postgraduate distance learners. Later studies have addressed issues such as information literacy and library skills instruction for distance learners (Kumar and Ochoa, 2012; Nazari, 2011;

Shaffer, 2011), the incidence of 'library anxiety' among distance learners, (Block, 2007), and how spatial metaphors affect distance education library services (Mirtz, 2010).

Of particular relevance to the research reported here, a small number of studies have examined distance learners' information behaviour in the round, and these are reported here.

Thórsteinsdóttir (2005) investigated the information-seeking behaviour of Library Information Science distance learning students and staff members at a Swedish University. Her study revealed that geographical distance had a significant influence on literature acquisition and information-seeking use even in online environments; that distance learners often experienced problems with locating information and mastering the techniques of seeking information, and with use of technology; and there was a link between access to library services and use of high-quality sources.

Boardi and Letsolo (2004) conducted a study on the information needs and information-seeking behaviour of distance learners in Lesotho. The study found that overall most respondents were satisfied with their sources of information, but relied mainly on easily accessible information. In Botswana, the Oladokun (2010a, 2010b) studies found significant evidence that students' information needs were significantly unmet, that printed sources, particularly books, were the most used information source format, that neither level of study nor location had a significant influence on students' preferred information source format and that a significant number of students depended on their lecturers and colleagues to supply information. Adetimirin and Omogbhe (2011) examined the library use and habits of distance learning students in a Nigerian university and found that the majority rarely used a library.

Van de Vord (2010) investigated the factors that increase the likelihood of students evaluating the relevance, currency, reliability, completeness and accuracy of online information. The findings indicated significant positive relationships between media awareness and information literacy, between access and information literacy and information efficacy, and between information efficacy and information literacy.

Byrne and Bates (2009) investigated the information behaviour of distance learning business students in Ireland. The study found that although both print and electronic resources were used by the students there was a general preference for electronic resources. This group of students acquired information through both formal sources (such as journals and course textbooks) and informal channels (conversations with lecturers, course providers, work colleagues, and classmates). The study of Sullo et al. (2012) reviewed 16 online classes in which there was an embedded librarian. 82 individual questions were reviewed. The category of general research guidance had the most questions (28), followed by citation questions (18), and using library resources questions (16). The study made recommendations for improving research guidance for distance learning students.

Parsons (2010) investigated the information access habits and mobile device use of higher education distance learners as well as their attitudes to future changes in their habits. The study found that although books and journals were accessed primarily in print respondents wanted to use them electronically in future; all other learning

materials were already available electronically. A longitudinal study by Alewine (2012) assessed the satisfaction of distance education students with library reference services through the use of a transaction-level survey. Findings revealed that the majority of distance students were online graduate students, and they were largely satisfied with the reference service.

A study by Brooke, McKinney and Donoghue (2013) used a multi-method approach, with as much, or more, emphasis on finding the views of librarians as of those of learners. A questionnaire survey of distance learning students at one university was complemented by a questionnaire survey of 66 librarians at UK institutions, plus three semi-structured interviews with librarians. A main finding was that there was a considerable discrepancy between what were perceived as the main challenges for distance learners by librarians, and what the learners themselves thought.

Sutherland's (2000) study on the information use of distance learners at Western Colorado Graduate School found that the majority of the survey participants borrowed materials from local academic and local public libraries. Similarly, Moyo and Ellysa (2003) carried out a survey to discover the attitudes of distance learners on the quality and use of available information sources and services at Penn State World Campus. Internet and electronic library resources were preferred to traditional library resources by most respondents. Tang and Tseng (2013) studied the information literacy skills of distance learning students, by an online survey of 3,517 students on a distance learning course at an American state university, but with a response rate of only 6.2% (219 responses) and found that students with a high level of confidence in information handling also had a high level of confidence in studying generally.

A synthesis of the above studies, which have looked specifically at the information-seeking behaviour of distance learners, showed that all focused on relatively small numbers of students, generally within a single geographic area. The majority were conducted in settings where distance learner students had access to both physical and electronic library provision. While some issues appeared as issues in several studies, there was insufficiently commonality to enable a model to be formulated, or general recommendations made for practice. The study reported here aimed to focus on a large and diverse group of distance learners, distributed in many different countries around the world, and reliant on digital library services, with the aim of providing a model of the information behaviour of distance learners, which could assist in providing such practical advice.

Models and hypotheses

The literature analysis shows that, not only has no conceptual information behaviour model has been devised specifically for the distance learning context, but that none of the existing models have been applied in studying the behaviour of distance learners. The next aim of the research reported here was therefore to choose, or create, a model to inform the empirical study.

A number of models have been proposed, covering various forms of information behaviour in various contexts. These are reviewed by Fisher, Erdelez, and McKechnie (2005), Bawden and Robinson (2012), Wilson (2010), Case (2012), and Robson and Robinson (2013 and 2015). To choose a set of models for consideration for this study, the following criteria were applied to potentially useful models:

- generally applicable to multiple contexts, occupations, roles and knowledge domains
- includes key distance learning variables, as identified from the literature analysis, such as access to peers and other support networks, high-quality information resources, technology issues, etc.
- includes issues of information needs and sources
- is based on empirical research and has been tested in subsequent studies
- can be related to a learning context
- adopt a user-centred, rather than system-centred, perspective

The models selected for comparison, applying these criteria, are those created by Wilson (1996), Dervin (Dervin, Foreman-Wernet and Lauterbach, 2003), Ellis (Ellis and Haughan, 1997), Kuhlthau (1991), Leckie, Pettigrew & Sylvain (1996), and Foster (2004).

Of these Wilson's model (Figure 1) was selected as the conceptual framework to guide this research. This model was chosen because it is comprehensive, applicable to various contents, roles and disciplines, and is well established in the field; as such, it is applicable in different contexts, roles and disciplines. It also includes the concept of 'intervening variables' that can enhance or hinder the whole process of information-seeking behaviour, including acquisition and use. This concept of 'intervening variables' is fundamental to distance learning as often learners are confronted with numerous barriers such as poor information and computer literacy (Thórsteinsdóttir 2005). It has also shown itself sufficiently flexible to be extended into new contexts; see, for example, Robson and Robinson (2013 and 2015) and Al-Muomen, Morris and Maynard (2012)

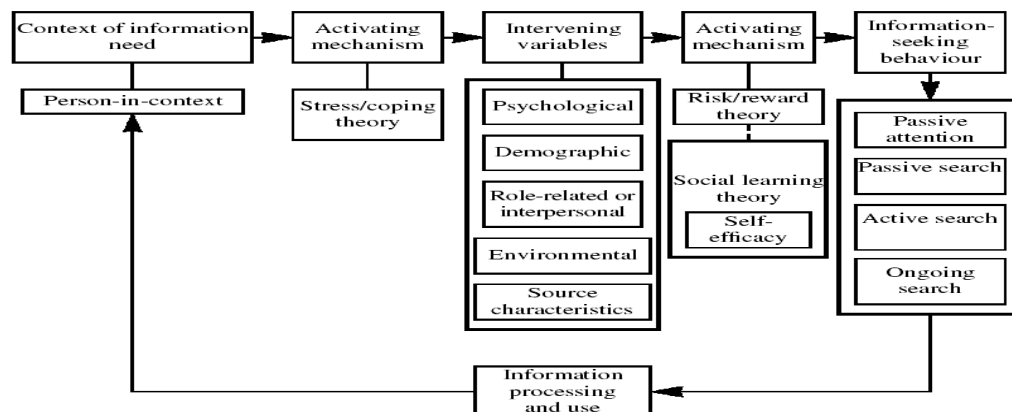


Figure 1: Wilson's 1996 revised model of information behaviour (adapted from Wilson 1999)

Using the components of Wilson's model together with the insights from the literature analysis, a series of testable hypotheses were drawn up, to establish whether variable of interest significantly influenced the information-seeking patterns and behaviours of distance learning students, and hence to provide answers to the research questions.

These were used to design the questionnaire used in the survey, and the results tested statistically.

Survey methods

The survey method used was a structured questionnaire, gathering primarily quantitative data, with some limited qualitative data. Despite the well-known limitations of questionnaires with respect to gathering rich, meaningful information (Pickard, 2013), it was felt that this method offered the best chance of gaining a substantial response. The main survey was preceded by a pilot study, involving a questionnaire and a small number of observations and interviews.

The study received ethical approval from City University London, where the researcher was registered for doctoral study, and from the University of London, where the student participants were registered. Participants were informed about the purposes of the study, and the intended use of the results, and gave their written approval.

The pilot survey employed a mix of online and printed questionnaires, to test which would gain best response, bearing in mind that not all participants would have ready and free online access. 500 participants, all distance learning law undergraduates, were invited to take part, by email, with the option to complete the questionnaire online or on paper. Only 92 questionnaires were returned, with a response rate of 17% for online questionnaires and 10% for printed.

After analyzing the results of the pilot study, a small face-to-face study was carried out, with four distance learning students who were in London at the time. This was to gain an understanding of how students used the system, to help ensure that the survey questions were appropriately phrased. This part of the study involved observation of the student using the Online Library with a 'think aloud' commentary, followed by a semi-structured interview.

The main study was designed using the experience of the pilot. The participants were 1000 students, representative of the wider range of distance learning programmes: Laws LLB (320); Laws LLM (80); EMFSS (Finance and Social Sciences) (320); Cefims (Centre for Financial and Management Studies) (112); CEDEP (Centre for Development, Environment and Policy) (80); MBA (International Management) (IM) (80); Educational and Social Research (MRES) (8). Participants were selected from all levels of programme, Diploma, first year, second year, third year and Master's level, rather than just Diploma and Master's level as selected in the Pilot Study. Participants were also selected to ensure a geographical spread including the major markets of the international programmes, such as Hong Kong, Malaysia, Trinidad and Tobago, Pakistan and the UK, and also those countries worldwide with fewer registered students.

The questionnaires were adapted from those used in the pilot, the questions being simplified and shortened, and the structure and coherence of the survey improved. Printed questionnaires were abandoned, and the questionnaire was emailed to all participants, rather than being posted on the Online Library gateway; this improved response rates, as well as ensuring that the questionnaires were filled in only once by the correct respondent. Email reminders were sent. Efforts were made to enthruse

respondents, taking advantage of the publicity generated by the introduction of a new discovery system in the Online Library. Consequently a better response rate of 65% was obtained, with 649 completed responses.

Survey questions

The survey asked respondents to reply to questions designed to establish a wide range of relevant factors that have an impact on their information-seeking behaviour. The questionnaire is shown in full in Appendix 1.

The questionnaire included questions designed to identify the *demographic characteristics* of the respondents (questions 1 to 4) in terms of gender, age, country of residence, and English language proficiency. The questions identified the current personal *educational context* of each respondent (questions 5 to 8) in terms of the programme for which they were registered, level of programme (access course, undergraduate or postgraduate), mode of study (whether studying independently or at an institution and whether receiving private tuition), and highest educational qualification.

Questions 9 to 11 of the survey investigated the *information-seeking activities* of the respondents including the purpose of information-seeking tasks undertaken, what type of resource was used most frequently, and the reasons for the preference.

Questions 12 to 32 asked about the *Online Library* and its facilities, about particular *information resources*, and about the respondents' interaction with them, including their self-evaluation of their use of them. The questions investigated whether the respondents use the Online Library, where they heard about it, how they access it, how they log on to it, and whether it meets all the respondents' information needs; they also elicited suggestions for changes in the Online Library. Some questions explored which individual resources are used by respondents, how successful they believe they are in using those resources, which alternative resources are used, and the reasons why they prefer their most-used resources. The questionnaire also sought to establish whether nearby libraries are accessible and where those libraries are located. Other questions asked about the extent of the respondents' confidence in using electronic resources, whether training is required (and how to arrange it), the respondents' use of the Summon search engine and their opinions about it, how the respondents search the Online Library, and what service improvements and additional online services would be desirable. Free text additional comments were also invited.

The main themes to which the data contribute findings are discussed below, drawing together the responses to the direct questions and the significant data from the cross-tabulation with other responses.

- Research Question 1: What are the information needs of distance learners at the University of London? This question is addressed by reference to survey question 9 and relevant cross-tabulations.
- Research Question 2: What kind of information sources and information channels are used by distance learners and why they are used? This question is addressed by survey questions 10, 11, 12, 13, 17, 19, 20, 23, 24 and relevant cross-tabulations.

• Research Question 3: What barriers do distance learners encounter when accessing and using Online Library resources? This question is addressed by survey questions 14, 15, 16, 18, 25, and relevant cross-tabulations.

• Research Question 4: To what extent does the Online Library meet distance learners' information needs? This question is addressed by survey questions 21, 22, 30, 31, and relevant cross-tabulations.

• Research Question 5: What practical solutions can be employed to help learners overcome the barriers they face when seeking, accessing and using information sources? This question is addressed by survey questions 27, 28, 29, 31, 32, 33 and relevant cross-tabulations.

Data Analysis

Data from the main study was analyzed by tabulating the answers from each respondent to each question and noting non-responses. The results were then cross-tabulated to discover significant relationships between the variables, in particular to relate information activities to demographic factors and personal contexts.

Statistical significance was assessed by chi-square tests, using Excel software. 'No responses' and all other non-specified categories such as 'other' have been omitted from the chi-square test in order to provide clear, unambiguous results. The chi-square *significance value* was taken as $p = 0.05$, and this was used to test the hypotheses above; those findings that were significant were used in answering the research questions. The full data and tabulations are given in Tury (2014).

Survey results and discussion

Demographic and Background Data

The response rates, as shown in Table 1, were in proportion to the overall size of the various University of London International Programmes and were broadly representative of the sample with the two largest programmes, Laws and EMFSS generating over 45% and 40% of the response respectively. Just over half (53%) of the respondents were female and 47% were male. The age distribution among respondents was dominated by those aged over 25, who account for 67%. The geographical distribution of the respondents was wide (81 countries). The large majority (72%) of respondents were following an undergraduate degree course and almost all the remaining respondents (23%) were following a higher-degree course.

Table 1: Number of respondents in each programme area

Programme of study	Number of respondents	Percentage of total respondents	Number in sample	Percentage of total sample
LLB	294	45.30%	320	32%
EMFSS	255	39.30%	320	32%
LLM	35	5.40%	80	8%
International Management	21	3.20%	80	8%
CEFIMS	18	2.80%	112	11.20%
CEDEP	16	2.50%	80	8%
MRES	8	1.20%	8	0.80%

Other	2	0.30%	0	0%
Total number respondents	649	100%	1000	100%

Table 2: Purpose of Respondents' Information Activity

Purpose of information gathering	Frequency	Percentage (%) of sample
Preparation for exams and tests	479	73.8
Course work and assignments	423	65.2
To supplement course materials	314	48.4
General Reading / Current awareness	192	29.6
Dissertation and Research	83	12.8
Other (please specify)	1	0.2

Research Question 1: What are the information needs of distance learners at the University of London?

The results indicate that distance learning information needs are strongly task-orientated and are determined by the need to complete course work or prepare for examinations. The majority of students (74%) sought information in order to prepare for exams and (65%) to complete their course work and assignments. The results show that there is a significant relationship between distance learners' information-seeking activities and gender. More female respondents engage in general reading activities, supplementing their course readings and more in-depth research than their male counterparts, roughly 55% to 45% in all cases. There is no significant relationship between 'purpose of information-seeking activity' and age. However, there is a significant correlation between the 'purpose of information activity' and level of programme, which itself is partly determined by age range. Of those nominating the purpose of 'dissertation and research' just over 55% were postgraduate students (post graduates formed only 15% of total responses) while 'course work and assignments' and 'preparation for examinations and tests' drew the largest number of respondent choices from among undergraduates, each with over 70%.

Research Question 2: What kind of information sources and information channels are used by distance learners and why they are used?

Information sources and channels used most frequently

The most used information sources were 'course textbooks' (80%) and 'free sources on the Internet' (79%). The Online Library was cited by just over 56% of respondents and the course VLE, which one would also have thought was essential, was cited by only 53%. This finding is different that Byrne and Bates (2009), who found that 84% of their participants regularly used the VLE. The extent of use of free sources on the Internet has implications for the provision of materials and raises important issues of information literacy support and development. This finding is consistent with the findings of Byrne and Bates (2009).

Just under a third of respondents supplemented course textbooks with other book purchases. 'Family and friends' as an information source / channel was specified by almost 10% of respondents (89% of them undergraduates) even though it was not given in the options available in the survey.

The heavy reliance on directed reading indicates the very important and central role of the faculty in the information-seeking behaviour of distance learners, particularly with regard to their information and resource use. These findings are in line with the findings of Byrne and Bates (2009), who concluded that lecturers, learning support officers and personal tutors played a vital role in assessing the validity of distance learners' resources. There very frequent use of 'family and friends' as an information source particularly by undergraduates, again in accordance with the findings of Byrne and Bates (2009), emphasizes the importance of social networks to distance learners and relates to initial findings from the observation part of the pilot study in which a student said "it's easy to get information from friends than from the library".

Gender, age and English language proficiency did not influence distance learners' choice of information sources or frequency of use. However, programme of study, level of programme, and mode of study all influenced the choice of resources and channels used most frequently. There was a low overall rate of success with almost all sources but there was a relationship between distance learners' most frequently used sources and success at accessing information

Reasons for choice of information resources

The most important resource selection criteria were 'easy to access' (74%), 'easy to use' (58%) and 'readily available' (54.4%). Quality was not a major consideration (17%) nor were reliability (22%) or relevance (34%). Level of Programme influenced distance learners' resource preferences, with postgraduates choosing 'relevance' (20%) and 'reliability' (30%) more than the overall proportion (15%). There is a relationship between reason for use of information sources and programme of study, law students, for example, favouring sources which they had previous experience, while EMFSS students were much more concerned with reliability and relevance. Mode of study was also found to be an important factor affecting choice of resources. This strong preference for ease of use, convenience and familiarity of sources, over quality, is consistent with the findings of Thórsteinsdóttir (2005) and Van de Vord (2010).

Use and awareness of the Online Library

The majority of students (77%) used the University of London Online Library, but a significant minority (20%) did not. Postgraduates were more likely than undergraduates to use it, reflecting the finding that postgraduates are more likely to choose reliable and high-quality resources. Programme of study an important factor, with more respondents from EMFSS using it than law students, as was mode of study, with more students studying at a private college using it than those studying independently. Use was not influenced by whether a student was a native English language speaker, nor by gender or age. Almost all students had learned about the Online Library from direct communications by the University and only a very small number of students (only 3 in total) had never heard of it.; non-use is not caused by ignorance of the resource's existence. The way in which users found out about the Online Library was influenced by numerous factors, including gender, English

language proficiency, programme of study, mode of study and level of programme; this finding has implications for the way in which library services are promoted.

Within the Online Library, use of particular resources was largely determined by programme of study, as might be expected, but age and level of programme was also important, with older respondents and postgraduates preferring specialized resources, while younger respondents used more general sources. Claimed success rates in finding information were higher for subject-specialized sources.

Use of alternative information sources

Respondents were asked about which other information resources they used during the course of their studies that were not provided by the Online Library. The majority of respondents used 'recommended textbooks', followed by 'tutor notes' and 'friends and family'; combined with a very low response rate for 'I don't use any other information source'. This emphasizes the importance of these alternative sources. Age and level of programme were important influences, with younger students and undergraduates relying more on alternative sources, as was programme of study, with law students relying more on these alternative sources than others and mode of study, with those studying independently relying more on alternative sources. Country of residence did not influence use of alternative sources, but those whose first language is not English made less use of alternative sources. These findings are at variance with those of Thórsteinsdóttir (2005) and Oladokun (2010a), who found that geographical location and distance had an influence on source preference. This may be because, with the very geographically dispersed group studied here, and differences due to particular locations will be evened out.

Reasons for choice of alternative sources were mainly familiarity, and ease of access and of use, rather than quality, relevance or being up-to-date. This was also found by Thórsteinsdóttir (2005, 223), who also noted that distance learners "chose information paths and sources that they had previously used with good results". Age had an influence here, with the middle 26-35 year range, typically postgraduates, being more likely to attend to reliability and quality than others. Programme of study had an influence, with law students seeking comprehensive and reliable resources more than students of other subjects. Affordability was a minor factor, but was mentioned as much by students in countries with a high standard of living as those in the developing world, in accordance with the findings of Thórsteinsdóttir (2005) and Oladokun (2010a).

Access to physical libraries

54% of students did not have access to any local library. Among those who do, most used libraries close to where they live, mainly university libraries. In the observation study that formed the preliminary part of this study, students said that public libraries were only used as a place to study. These findings confirm those of other studies (Unwin et al. 1998; Boardi et al. 2004; Oladokun 2010b) which found that distance learners frequently used local public libraries more than their university library although they often found such collections lacking.

Research Question 3: What barriers do distance learners encounter when accessing and using Online Library resources?

1 A large majority of participants accessed the Online Library from home, although
2 younger students were more likely to access from an educational institution, and the
3 older age ranges, and those studying independently, to access from the workplace.
4 Country of residence appeared to have no effect, and in general there seemed few
5 barriers to accessing online resources.
6

7 In terms of success in accessing required information, relatively few respondents
8 claimed to be always successful (10%) or never successful (6%); a matter of concern
9 is that only about one third claimed to always, or frequently, find the information they
10 need. There was no very clear pattern of relation of success or failure to other factors,
11 although there were indications that it was the younger, undergraduate students, and
12 some of those studying independently, who had least success.
13
14

15 There was a strong correlation between claimed success at accessing Online Library
16 resources and confidence in using digital resources. However, there remained a
17 notable group of students with high confidence but low levels of success; it appeared
18 that at least some over-estimated their abilities in this respect. Postgraduate students
19 were very much more confident than undergraduates, but the relation between
20 confidence and age and gender was unclear. Law students were notably less confident
21 than those in other subject areas, suggesting a particular problem with their use of
22 specialist databases.
23
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25 26 27 **Research Question 4: To what extent does the Online Library meet distance** 28 **learners' information needs?**

29 Although the Online Library met some needs of all respondents, it fully the answered
30 the needs of less than half. Postgraduates, with wide and less well-defined
31 information needs, were less likely than undergraduates to believe that it met all their
32 needs, as were those studying independently, and those studying certain subjects, such
33 as international development.
34
35

36 The most commonly used search method was database browsing (66%), followed by
37 the Journal Finder (53%), browsing the gateway (37%) and site search (24%) with the
38 A-Z being the least used method. This indicates that search functions were not
39 understood, not trusted, or are too complex for the task. There was very low use of the
40 *Summon* discovery tool, though this had been introduced only shortly before the
41 survey was conducted.
42
43

44 Eight broad categories of service improvements were mentioned:

- 45 • access to a broader range of resources, particularly e-books
 - 46 • more guidance and support in using the Online Library, particularly online
 - 47 help and training guides
 - 48 • more support to prepare for exams
 - 49 • easier and improved access to Online Library resources
 - 50 • improved search facilities
 - 51 • more individual support for students who live outside the UK
 - 52 • more opportunities to communicate with tutors and fellow students
 - 53 • increased awareness of resources and system facilities
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59 **Research Question 5: What practical solutions can be employed to help learners**
60 **overcome the barriers they face when seeking, accessing and using information**
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sources?

Training in use of library systems and information resources is the major issue. This was requested particularly by undergraduates, and those studying certain subjects, such as law. However, it is a need which was expressed by a wide cross-section of respondents, including those who expressed a high level of confidence in using library systems, and those who were successful in finding the information they needed.

Promotion of new system features is clearly of importance, as evidenced by the small proportion of those who had used the recently introduced Summon discovery system and the high levels of satisfaction of the minority who had used it. Providing extra resources is clearly valuable, but only if accompanied by promotion of their availability and training in their use.

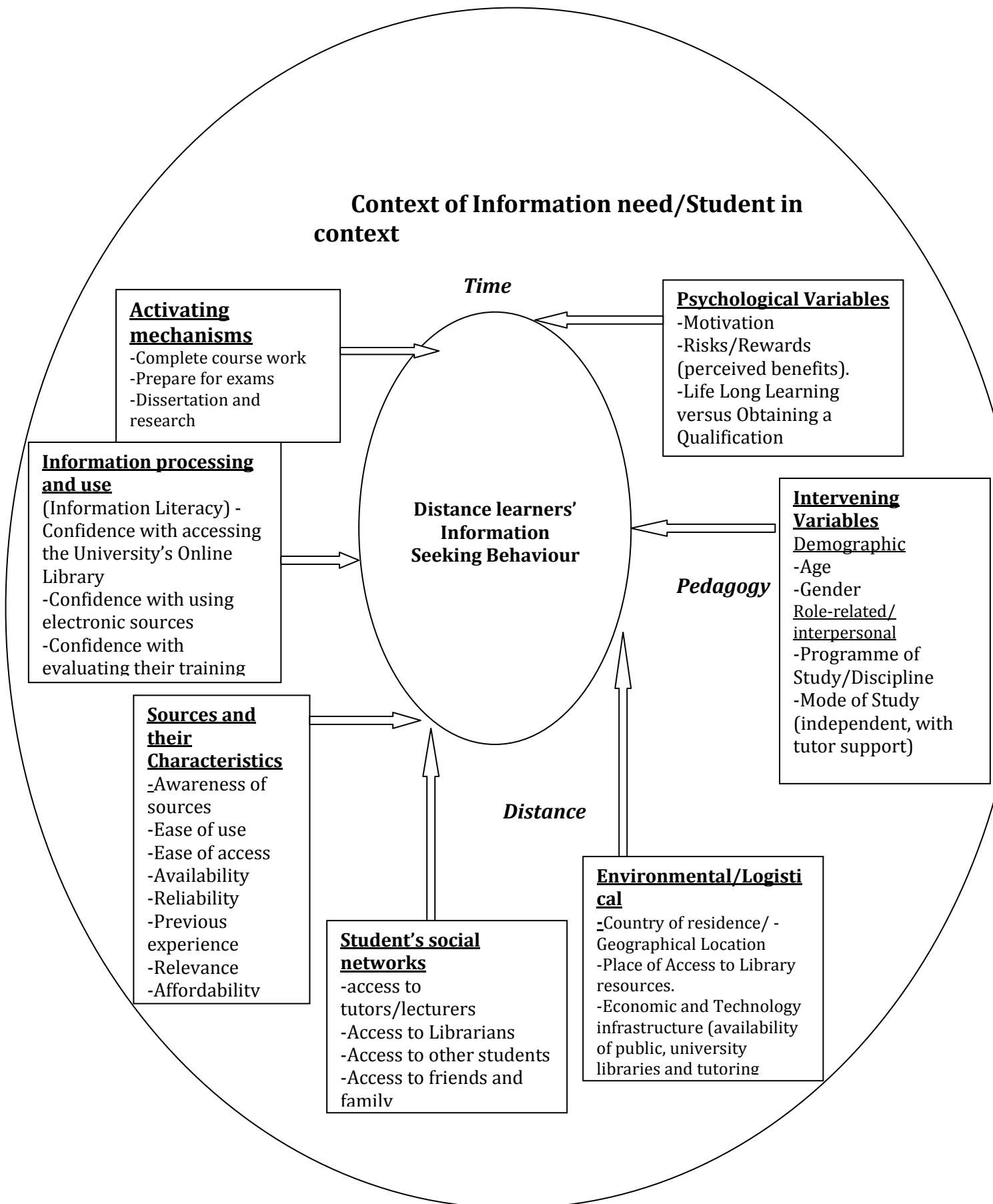
A new model for the information behaviour of distance learners

As discussed above, Wilson's 1996 model was found to be the best information behaviour to provide a conceptual framework for this study. In light of the results, a revised version of this model can be derived, specifically for considering the distance learning context. This variant of the model, shown in Figure 2, extends some of the generic variables of the original, to make them more specifically relevant to distance learning. The extended components are as follows:

- context of information need (the unique information environment of distance learners which is governed by time, distance and pedagogy)
- person-in -context (the learner's personal and other role-related characteristics such as age, gender, student)
- activating mechanisms (what motivates a learner to seek information such as the need to complete course work, prepare for exams)
- intervening variables or factors which hinder or enhance the information-seeking process such as a learner's motivation, age, programme of study and mode of study, geographical location, resources availability and their characteristics (accessibility and reliability).

This extension leaves unchanged the basic structure of the model, expressing the information seeking process, while allowing a concentration on the aspects of most importance for distance learners. The ability to customize the contextual factors, in particular affecting the success of information seeking, is a strength of this conceptual model. It is a means of understanding the processes, and comparing different situation and contexts of information seeking, but is also a tool of practical value, foregrounding the wide range of specific concerns of distance learners and their interconnectedness.

Figure 2: An extension of Wilson's model for the information behaviours of distance learners



Conclusions

The results of this study have emphasized the complex information behaviour of distance students, and the variety of inter-related issues involved. There is not always a clear pattern: gender and age, for instance, are important for some issues, not for others. Level of subject and study appear generally important, the geographical location of the learner not so. Distance learners, however, are not a homogenous group. Nor is the fact of their being distance learners necessarily the dominant factor in their information behaviour: that they say, a postgraduate student, or a law student, seems to be of more significance.

The behaviour of the group studied here fits a generally accepted pattern: ease and speed of access, and familiarity of sources, is seen, for the most part and with important exceptions, as more important than issues of quality, reliability, and comprehensiveness. The principle of least effort, and the tactic of 'satisficing', are as important for distance learners as for other groups. The task for information providers is to work within this context, while trying to promote the value of high-quality relevant sources.

Practical lessons are that promotion of systems and resources, and training in their use, is particularly important to this physically separated groups; but that, as much as, if not more than, with any other context, it needs to be tailored to sub-groups, subjects and demographics.

The extended version of the Wilson model proposed here should be of value as a basis for further investigation of information needs and behaviour of distance learners, likely to be an increasingly important category of students in future, as well as addition to the study of information behaviour *per se*.

References

- Adetimirin, A. & Omogbhe, G. (2011). Library habits of distance learning students of the University of Ibadan, Ibadan, Oyo State. *Nigeria, Library Philosophy and Practice* [online], no pages, available from <http://www.webpages.uidaho.edu/~mbolin/adetimirin-omogbhe.htm> (accessed on 25 January 2015).
- Al-Muomen, N., Morris, A. & Maynard, S. (2012). Modelling information-seeking behaviour of graduate students at Kuwait University. *Journal of Documentation* 68(4), 430-459.
- Alewine, M.C. (2012). Listen to what they have to say! Assessing distance learners' satisfaction with library services using a transactional survey. *Journal of Library and Information Services in Distance Learning*. 6(3/4), 136-146.
- Ball, R. (2003). Libraries and distance education – a German view. *Libri* 53(2), 71-81.
- Bawden, D. & Robinson, L. (2012). Information behaviour, chapter 9 of *Introduction to Information Science*. London: Facet, pp 187-210.
- Beagle, D. (2000). 'Web-based learning environments: do libraries matter?'. *College and Research Libraries*. 61(4), 367-379.
- Block, J. (2007). Library anxiety and the distance learning graduate student: a case study of Eastern Michigan University. *MLA Forum* 5(3), [online] available at http://journaldatabase.info/articles/library_anxiety_distance_learning.html [accessed 25 January 2015].
- Boardi, B.Y. & Letsolo, P. (2004). Information needs and information seeking behaviour of distance learners at the Institute of Extra-Mural Studies in Lesotho, *International Development*. 20(3), 189-199.
- Brooke, C., McKinney P. & Donoghue, A. (2013). Provision of distance learner support services at UK universities: identification of best practice and institutional case study. *Library Trends* 61(3), 613-35.
- Byrne, S. & Bates, J. (2009). Use of the university library, elibrary, VLE, and other information sources by distance learning students in University College Dublin: Implications for Academic Librarianship. *New Review of Academic Librarianship*. 15(1), 120-141
- Case, D.O. (2012). *Looking for information: a survey of research on information seeking needs, and behaviour*. 3rd edn, Bingley: Emerald.
- Cassner, M. & Adams, K.E. (2012). Continuing education for distance librarians. *Journal of Library and Information Services in Distance Learning*. 6(2), 117-128.
- Catelano, A. (2013). Patterns of graduate students' information seeking behaviour: a meta-synthesis of the literature. *Journal of Documentation*. 69(2), 243-274.

- Coonin, B., Williams, B.F. & Steiner, H. (2011). Fostering Library as a Place for Distance Students: Best Practices from Two Universities. *Internet Reference Services Quarterly*. 16(4), 149-158.
- Davis, V. (2007). Challenges of connecting off-campus agricultural science users with library services. *Journal of Agricultural and Food Information*. 8(2), 39-47.
- Dervin, B., Foreman-Wernet, L. & Lauterbach, E. (2003). *Sense-Making methodology reader: selected writings of Brenda Devin*. Cresskill NJ: Hampton Press.
- Ellis, D. & Haugan, M. (1997). Modelling the information seeking patterns of engineers and research scientists in an industrial environment. *Journal of Documentation*. 53, 384-403.
- Fisher, K.E., Erdelez, S. & McKechnie, L.E.F. (eds.) (2005). *Theories of information behavior*. Medford NJ: Information Today.
- Foster, A. (2004). 'A non-linear model of information seeking behavior'. *Journal of the American Society for Information Science and Technology*. 55(3), 228-237.
- Groce, H. (2008). Information-seeking habits and information literacy of community and junior college students a review of literature. *Community and Junior College Libraries*. 14(3), 191-199.
- Hensley, M. & Miller, R. (2010). Listening from a distance: a survey of University of Illinois distance learners and its implication from meaningful instruction. *Journal of Library Administration*. 50(5/6), 67-683.
- Herring, S.D. (2010). Research on libraries and distance education: an analysis of articles published 1999-2009. *Journal of Library & Information Services in Distance Learning*. 4(3), 137-146.
- Holloway, K. (2011). Outreach to distance students: a case study of a new distance librarian. *Journal of Library & Information Services in Distance Learning*. 5(1/2), 25-33.
- Iyer, H. (2012). *Distance learning: information access and services for virtual users*. London: Routledge.
- Kenyon Jones, C. (2008). *The People's University 1858-2008*. London: University of London.
- Kuhlthau, C. (1991). Inside the search process: information Seeking from the user's Perspective. *Journal of the American Society for information Science*. 42(5), 361-371.
- Kumar, S. & Ochoa, M. (2012). Program-integrated information literacy instruction for online graduate students. *Journal of Library & Information Services in Distance Learning*. 6(2), 67-78.

- Lebowitz, G. (1997). Library services to distant students: an equity issue. *Journal of Academic Librarianship*. 23(4), 302-308.
- Leckie, G.J., Pettigrew, K.E., & Sylvain, C. (1996). Modeling the information seeking of professionals: a general model derived from research on engineers, health care professionals and lawyers. *Library Quarterly* 66(2), 161-193.
- Lockerby, R. & Stillwell, B. (2010). Retooling library services for online students in tough economic times. *Journal of Library Administration*. 50(7/8), 779-788.
- Mirtz, R. (2010). Spatial metaphors and distance learning library services: why “where” makes a difference. *Journal of Library Administration*. 50(7/8), 857-866.
- Moyo, L. & S. Ellysa (2003). Meeting the needs of remote library users. *Library Management*. 24 (6/7), 281-290.
- Murphy, M., Franklin, S. & Raia, A. (2007). Delivering library services to users: a case study of the Sooner Express service at the University of Oklahoma, *Journal of Access Services*. 5(1/2), 349-356.
- Nazari, M. (2011). A contextual model of information literacy. *Journal of Information Science*. 37(4), 345-359.
- Oladokun, O. (2014). The information environment of distance learners: a literature review. *Creative Education*. 5(5), 303-317.
- Oladokun, O. (2010a). A comparison of the information seeking pattern of distance learners in Botswana: a case study of four tertiary institutions. *Journal of Library and Information Services in Distance Learning*. 4(3), 119-136.
- Oladokun, O. (2010b). Information seeking behaviour of the off-campus students at the University of Botswana: a case of two satellite centers. *Journal of Library Administration*. 50(7/8), 883-898.
- Parsons, G. (2010). Information provision for HE distance learners using mobile devices. *Electronic Library*. 28(2), 231-244.
- Pickard, A.J. (2013). *Research methods in information (2nd edn.)*. London: Facet.
- Quality Assurance Agency (2005). Institutional audit: University of London International Programmes, London. Available at <http://www.qaa.ac.uk/reviews-and-reports/provider?UKPRN=30436>, last accessed 17 February 2015.
- Quality Assurance Agency (2011), Institutional audit: University of London International Programmes, London, available at <http://www.qaa.ac.uk/reviews-and-reports/provider?UKPRN=30436>, last accessed 17 February 2015.
- Raraigh-Hopper, J. (2010). Improving library services for distance learners: a literature review. *Reference Librarian*. 51(1), 69-78.

- Rebmann, K.R., Molitor, S. & Rainey, B. (2012). Distance learning skills and responsibilities: a content analysis of job announcements 1996-2010. *Journal of Library and Information Services in Distance Learning*. 6(2), 100-116.
- Renner, B.R., Vardaman, A.S. & Norton, M.J. (2007). Best practices for medical libraries to deliver materials to distance learners. *Journal of Interlibrary Loan, Document Supply and Electronic Reserve*. 17(3), 85-97.
- Robson, A. & Robinson, L. (2013). Building on models of information behaviour: linking information seeking and communication. *Journal of Documentation* 69(2), 169-193.
- Robson, A. & Robinson, L. (2015). The Information Seeking and Communication Model: a study of its practical application in healthcare. *Journal of Documentation*. 71(5), in press.
- Shaffer, B.A. (2011). Graduate student library research skills: is online instruction effective?. *Journal of Library and Information Services in Distance Learning*. 5(1/2), 35-55.
- Shell, L.B., Duvernay, J., Ewbank, A.D., Konomos, P., Leaming, A. & Sylvester, G. (2010). A comprehensive plan for library support of online and extended education, *Journal of Library Administration*. 50(7/8), 951-971.
- Sullo, E., Harrod, T., Butera, G. & Gomes, A. (2012). 'Rethinking library service to distance education students: analyzing the embedded librarian model'. *Medical Reference Services Quarterly*. 31(1), 25-33.
- Sutherland, J. (2000). *Distance education: library use among adult distance learners: its implications for local public and academic libraries*. MLIS Thesis presented to University of Denver, Denver CO.
- Tang, Y. (2009). Placing theory into practice: an exploration of library services to distance learners at Jacksonville State University. *Journal of Library and Information Services in Distance Learning*. 3(3/4), 173-181.
- Tang, Y. (2013). Distance education librarians in the United States: a study of job announcements. *Journal of Academic Librarianship*. 39(6), 500-505.
- Tang, Y. and Tseng, H.W. (2013). Distance learners' self-efficacy and information literacy skills. *Journal of Academic Librarianship*. 39(6), 517-521.
- Thórsteinsdóttir, G. (2005). *The information seeking behaviour of distance students: a study of twenty Swedish library and information science students*. Doctoral thesis. University of Borås, Sweden, available at <http://bada.hb.se/handle/2320/2573>, accessed 25 January 2015.
- Tury, S. (2014). The information seeking behaviour of distance learners: a framework for supporting library use at the University of London. Doctoral thesis, City University London, available via <http://openaccess.city.ac.uk>, accessed 2 March 2015.

- 1 Unwin, L. (1994). "I'm a real student now": the importance of library access for
2 distance learning students', *Education Libraries Journal* 37(2), 1-20.
3
4
5 Unwin, L. Stephens, K. & Bolton, N. (1997). *The role of the library in distance*
6 *learning: a study of postgraduate students, course providers and librarians in the UK.*
7 British Library Research Series). London: Bowker-Saur.
8
9
10 Urquhart, C. & Rowley, J. (2007). Understanding student information behavior in
11 relation to electronic information services: Lessons from longitudinal monitoring and
12 evaluation, part 2. *Journal of the American Society for Information Science and*
13 *Technology*. 58(8), 1188-1197.
14
15
16 Van de Vord, R. (2010). Distance students and online research: promoting
17 information literacy through media literacy. *Internet and Higher Education*. 13(3),
18 170-175.
19
20
21 Walsh, C. (2010). 'How can we help?' Developing library staff skills to support e-
22 learners at the University of East London. *SCONUL Focus*. No. 48 (April 2010), 29-
23 31.
24
25
26 Wilson, T.D. (2010). Information behavior models. *Encyclopedia of Information*
27 *Science and Technology (3rd edn.)*. London: Taylor and Francis, 1:1, 2392-2400.
28
29
30 Wilson, T.D. (1999). Models in information behaviour research. *Journal of*
31 *Documentation*. 55(3), 249-270.
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Appendix 1: Survey questions

Profile of respondents

1. Are you male or female?

Male Female

2. What age are you?

Under 25 26-35 36-45 46-55 56 +

3. Which country do you live in?

4. Is English your first language?

Yes No

5. What programme are you studying on?

CeFIMS EMFSS International management (RHUL)
MRES Laws (Laws Consortium) Other

6. What level is your course programme?

Undergraduate Post Graduate Diploma Certificate Access

7. What is your mode of study?

At an institution (supplemented by private tuition)
At an institution (with no private tuition)
Independent study (with private tuition)
Independent study (with NO private tuition)
Other (please specify)

8. What is your current highest educational qualification?

Undergraduate Degree Post Graduate Degree Diploma Certificate

Access/Foundation A-Level Other (please specify)

Purpose of your information gathering exercise

1 9. What is the purpose of your information gathering exercise?
2

3 Course work and assignments Preparation for exams and tests
4

5 General Reading/Current awareness To supplement course materials
6

7 Dissertation and Research Other (Please specify)
8
9

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11
12 10. When gathering information, what sources do use most frequently?
13 (you can select more than one)
14

15 Course text books Free sources on the internet Course VLE
16

17 Online LibraryE-books Purchase Books Newspapers
18

19 Thesis and Dissertation Print journals conference proceedings
20

21 Other
22
23
24
25

26 11. What are your reasons for your preferences (can select more than one)
27

28 They are easy to use They are easy to access Readily available
29

30 They are reliable I have previous experience They are relevant
31

32 They are affordable they are high quality Other
33
34
35
36

37 12. Do you use the Online Library at (<http://external.shl.london.ac.uk/>)?
38

39 Yes No
40
41
42

43 13. Where did you hear about the Online Library?
44

45 Tutor
46

47 Course pack
48

49 VLE
50

51 Fellow student
52

53 Other (please state)
54

55 Never heard of it
56

57 14. Where do you access the Online Library from?
58

59 At home At work At internet café Other (Please specify)
60
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1 15. How do you access the Online Library?
2

3 From the VLE From the University website From my bookmarks
4

5 I Google it My Athens Directly at website Other (please specify)
6
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8

9 16. What is your preferred login method and why?
10

11 Athens Portal password Both Other (specify)
12
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15 17. Which of the following information resources provided on the Online Library
16 have you used during the course of your study?
17

18 ABI/Inform
19 Academic search premier
20 Business Source Premier
21 Case track
22 Educational Indexes (ERIC, BEI, AEI)
23 IBSS
24 Hein Online
25 JSTOR
26 Justis
27 Kluwer Arbitration
28 Lexis Library
29 Sage journals
30 Science Direct
31 Web of Knowledge
32 Westlaw
33 Wiley Interscience
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41 18. How successful do you believe you are at accessing information resources
42 provided by the databases listed above?
43

44 I always access the information I need
45 I regularly access the information I need
46 I sometimes access the information I need
47 I never access the information I need
48
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52 19. Which of the following resources not available on the Online Library do you also
53 use?
54

55 Tutor notes
56 Friends and family
57 Recommended Textbooks
58 I don't use any other information source
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Other (please specify)

20. Why do you prefer the resources you use most frequently?

.....

21. In your opinion does the Online Library meet all your library and information needs?

Yes No

22. If your answer to the above is 'NO' please tell us what changes in the information service you would you like to see? Your feedback is really important to us, and will enable us to develop a service that meets your individual needs.

Simple notes. Details example so as to understand problem. More precise and focus notes.

23. Do you use have access to any other library near where you live?

Yes No

24. If you said 'yes' to the above, can you please tell us the name of the library and country or other details (this will enable us to compile a list of useful local libraries).

25. How confident are you in using electronic resources?

I am very confident I find it fairly easy I am not confident Other (specify)

26. Would you like to receive some training in using the Online Library?

Yes No

27. If yes, please tell us the best way to contact you to arrange the training (e.g. email or telephone including country code)

28. Have you used the new library search engine Summon found at
(<http://external.shl.london.ac.uk/summon/index.php>) ?

Yes No

29. Please tell us what you think?

30. How do you search the Online Library for information? (can select more than one)

I browse the databases

I use the journal finder

I browse resources available on my course gateway.

I use the site search

I use Summon

I use the A-Z

Other (specify)

31. What improvements in the service we provide would you like to see made to the Online Library?

I would like more journals (please specify).....

I would like more e-books (please specify).....

I would like more databases (please specify).....

More useful website suggestions

I would like to be able access resources easily

I would like to be able to communicate with the Online Library team at any time.

I would like more online help and training guides

32. Which of these online services would you find helpful?

Ebooks Podcasts Facebook Twitter Blog inter library loan
service Instant ask a librarian enquiry service Longer enquiry service hours
Interactive Tutorials Discussion forum. Other (please specify)

33. Are there any further comments you would like to make about the Online Library.

Thank you for your time. Your honest feedback is really important to us and will enable us to develop the service that meets your individual needs.

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Response to reviewers

The paper has been proof-read, typographical errors corrected, and the reference format made consistent.

Additional comment has been given on the expanded Wilson model, and an extra relevant reference added.

We have considered the suggestion of referee 2 that details should be omitted. However, this referee gives no indication of where this should be done, and the advice seem to contradict that of referee 1 that the article is “filled with useful information”. We have therefore not omitted anything, but will happily do so if given more detailed advice.

Cover letter

Please find attached our revised paper, unchanged title page, and response to reviewers' comments

Thank you