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USE OF THE UNIVERSITY LIBRARY, ELIBRARY, VLE, AND OTHER INFORMATION SOURCES BY DISTANCE LEARNING STUDENTS IN UNIVERSITY COLLEGE DUBLIN: IMPLICATIONS FOR ACADEMIC LIBRARIANSHIP

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This paper reports on a study of the information behavior of Bachelor of Business Studies (BBS) distance learning students in the Quinn School of Business, University College Dublin (UCD). In order to gain a better understanding of the information behaviors of distance-learning students, the study sought to answer the following research questions:

- *What are the main sources of information for the BBS distance learning students?*
- *What are student perceptions of the virtual learning environment (VLE), Blackboard employed by the Quinn School of Business?*
- *To what extent, if any, is there evidence of collaborative information behaviors and practices?*

The full cohort of BBS distance-learning students was surveyed. A total of 55 out of 136 (40.4%) responded to the survey. Data were collected by means of a self-completion online questionnaire. The paper presents the findings of the study and considers implications for academic librarianship. The chief sources used by the students to assist them with study are web search engines (primarily Google) and content from the VLE (Blackboard). Search engines and the university elibrary are the main sources used by the students when conducting an information search for their course, however the students also rely significantly on their lecturers with regard to acquiring information for their coursework. The study also found that collaboration with regard to information sharing is a major facet of the information world of this cohort of students.

Keywords: distance learning, information behavior, internet, Ireland, libraries, students

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Introduction

Human information behavior is one of the most popular and well documented research areas in the field of library and information studies: "It appears that the study of human information behaviour is now a well defined area of research within information science, and research is beginning to show the benefits of accumulated knowledge" (Wilson, 2000, 53). How humans seek, retrieve, and use information has for decades been a topic that has held much interest for library and information science (LIS) researchers. Much of this research focuses on how we seek and retrieve information in our everyday lives, be it in a social or professional context. Case (2007) identifies studies that examine information behavior by occupation, by social role, and by demographic group. He suggests that "One of the most widely studied roles of all (given the voluminous research literatures on education and learning) is that of student – a category that virtually everyone inhabits at some point during their lives" (301). Those who have studied student information behavior include Chung and Neuman (2006), Callinan (2005), CIBER (2007), Heinström (2003), Kuhlthau (2004, 1991), O'Farrell and Bates (2009), and Thórsteinsdóttir (2001).

As student teaching and learning methods become more flexible, research needs to reflect this. There is a notable gap in the literature with regard to studies relating to the information behavior of distance learning students, a gap which the current study hopes to fill. According to Thórsteinsdóttir (2001), "There is a constant stream of studies focussing on young undergraduates' information behaviour. Distance learners and mature students, if included in the studies are not usually identified as such." As well as learning about these students' information behaviors, it is also necessary to reflect on the implications for academic librarianship.

Education has undergone substantive changes in the last number of years most notably with advancements in information communication technologies (ICTs,) which have opened up the boundaries of education and in particular teaching and learning methods. According to Beldarrain (2006), "Technology has played a key role in the changing dynamics" of distance learning and is "responsible for distorting the concept of distance between

learner and instructor, and enabling learners to access education at any time and from any place" (139). As Beard and Dale (2008) have stated, "The relationship between the learner, their background, the resources, and their media as well as the places in and from which students learn are all changing" (100).

In light of this, this study focused on how distant learning students, in a third level university in Ireland, met their academic information needs. The overall objective of the study being reported here was to examine the information behaviors of BBS distance learning students of the Quinn School of Business, University College Dublin and to ascertain how these students access material for their course. The research questions were:

- What are the main sources of information for the BBS distance learning students?
- What are student perceptions of the virtual learning environment (VLE), Blackboard, employed by the Quinn School of Business?
- To what extent, if any, is there evidence of collaborative information behaviors and practices?

Whereas the study does not claim to be generalizable in a wider context, the findings nonetheless should be of interest to those involved in the education of, and information provision for, online distance learning students.

Literature

Newton (2007) describes online distance learning students as "off-campus students" and further expands to suggest this term means "any student who normally studies at a distance from the parent institution and gains access to library resources and services to support their studies primarily through using electronic communication" (140). Wentling et al. (2000) define online distance learning as "the acquisition and use of knowledge distributed and facilitated primarily by electronic means" (4). According to Thórsteinsdóttir (2001) distance learning "is shaped and adapted to the students' needs, rather than to the needs of the teachers or the institution offering the course. It might be described as a personal learning for it removes the barriers of space, time and

location." Increasingly, however, this is true for all students: "An overarching trend is emerging, whereby many students may not attend on campus but require all the facilities of a modern university. Student cohorts are merging to become a mix of remote and on-campus learners, and so the term 'distance learner' is less relevant" (Weaver, 2006, 14), for example, the Quinn School of Business in University College Dublin offers both classroom based degree programs, as well as those delivered online. Therefore, what can be learned from studying the information behaviors of distance learning students, may also be applicable to a wider student body. However, it should not be assumed that all students (distance learning students, mature students, and more traditional student groupings) will have the same information needs, or seek information in the same way.

Although there is a convergence in terms of student types, facilitated by greater flexibility not only in the area of online distance learning but also within the traditional university model, it is important to recognize that "The profile of distance learning students can be very different to that of full time students. Distance learners come from a wide range of backgrounds, many have had little formal education, or are returning to education after a long gap" (Donaldson, 2004, 69). This can have implications in terms of learning approaches, information literacy and ICT skills. Distance learning students can have different needs to those of more traditional students, and this is borne out in the literature. As Thórsteinsdóttir (2001) notes "Flexible learning requires a different type pedagogy and service then the university and the university library traditionally offer." Educational institutions and libraries need to be more flexible in their approach so as to avoid alienating these "flexible learners." Thórsteinsdóttir (2001) goes further to suggest that in order "to be able to improve the conditions for distance learners we need deeper knowledge about the hindrances and problems distance learners face in their information-seeking process."

One of the reasons for the rise in popularity of distance learning courses is that they have the potential to offer greater flexibility. According to Evans and Nation (1996), "The increasing sophistication and specialisation of contemporary society, especially with regard to the nature of work and new technologies, is producing changes to the ways in which education is used, developed

and presented" (3). The choice and availability of online courses has grown dramatically in the last number of years and will no doubt continue to do so.

A number of benefits of distance learning are outlined on the Distance Learning College Guide website, these include increased access to learning, promotion of lifelong learning, facilitation of interactive teamwork between groups, and strong instructor-student communication. Online learning, in particular, has further advantages. Students can participate and interact in real time, by means of electronic whiteboards and chat facilities, and asynchronously through online forums and discussion boards.

Wentling et al. (2000) predict that improvements in online distance learning "will continue to occur" and that "these advances will be wireless, highly intelligent, interactive and integrative, accessible and easy to use" (23). They suggest that the online distance learning student body will be "self-directed, operate on flexitime, be technologically savvy, have high collaborative fluency and be intrinsically motivated to pursue life-long learning" (24). They also propose that online distance learning calls for a new skill to be adopted by students and course facilitators and identify this as "collaboration fluency" (22). The idea of collaboration and interaction is a central component of online distance learning. This involves collaboration between instructor and student, as well as peer-to-peer collaboration.

Foster (2006) provides an operational definition of collaborative information behavior which he describes as "the study of the systems and practices that enable individuals to collaborate during the seeking, searching, and retrieval of information" (330). According to Talja and Hansen (2006) "collaborative information behaviour (CIB) is emerging as a new direction and central research area within human information behaviour (HIB)" (114). The authors define CIB as "an activity where two or more actors communicate to identify information for accomplishing a task or solving a problem" (114).

In terms of the wider literature regarding student information behavior, Chung and Neuman (2006) explored "how students use information for learning in today's information-rich environment" (1504). The study involved analyzing the information seeking habits and information use of twenty-one high school

honor students, over a two-week period. The main findings of this study show that all students indicated that the internet was among their first choice when beginning an information search.

Callinan (2005), who also studied students at the University College Dublin, found that while students did utilize electronic resources through the library website, they were somewhat hindered by their lack of awareness of the many electronic sources offered and would benefit from "instruction on how to find journals and to search for them electronically as well as how to use electronic databases" (96).

A study by George et al. (2006) found that "people, especially academic staff, play a central role" (20). Results from the George et al. study also show that students rely significantly on the internet, as well as other electronic resources, like library websites. This further reinforces the notion of the central role of the internet as mentioned in the Chung and Neuman (2006) study.

Findings from an Online Computer Library Center report (OCLC, 2006) also indicate a strong preference among college students for the internet and search engines when conducting an information search. The authors note that "Libraries, many of their resources and services, and the information experts who work in libraries appear to be increasingly less visible in a universe of abundant information" (6-1). This notion of increased usage of online resources with a seeming decrease in print sources is a theme which is widespread in recent literature and research on student information behavior (for example, Groce, 2008; OCLC, 2006; Kelley and Orr, 2003; Jones, 2002) and will be discussed further in this paper.

A study carried out by Newton (2007) "examined the potential and actual roles that academic librarians play in supporting the development of information literate off-campus learners" (140). This study took the form of interviews and survey of UK academic librarians and advocates more integration and collaboration between course providers, academic librarians, and students to ensure effective and intuitive teaching and learning methods for distance learning students. Newton (2007) emphasizes the need for "effective engagement across all staff involved in dealing with off-campus learners" (153).

Beldarrain (2006), who studied the use of ICTs by distance-learning students, believes that as these "new technologies

emerge, instructional designers and educators have unique opportunities to foster interaction and collaboration among learners, thus creating a true learning community" (140).

Research Method

The Bachelor of Business Studies in UCD is a part time undergraduate program designed for students who are not in a position to study full time and for those with work experience who wish to return to education to complete an undergraduate program while working full time. The flexible nature of the program makes it a very appealing mode of study (the course combines home study with a small number of weekend classes). It covers a broad range of business modules and as shown in Figure 1 is offered online through The Centre for Distance Learning at the UCD Quinn School of Business.

It was feasible to survey the total population of online distance learning BBS students, due to the relatively small number of students in this group. The group is comprised of 136 students in total. Data was collected through an online self completion questionnaire. The questionnaire was comprised of twenty-six questions, most of which were quantitative in nature. It included

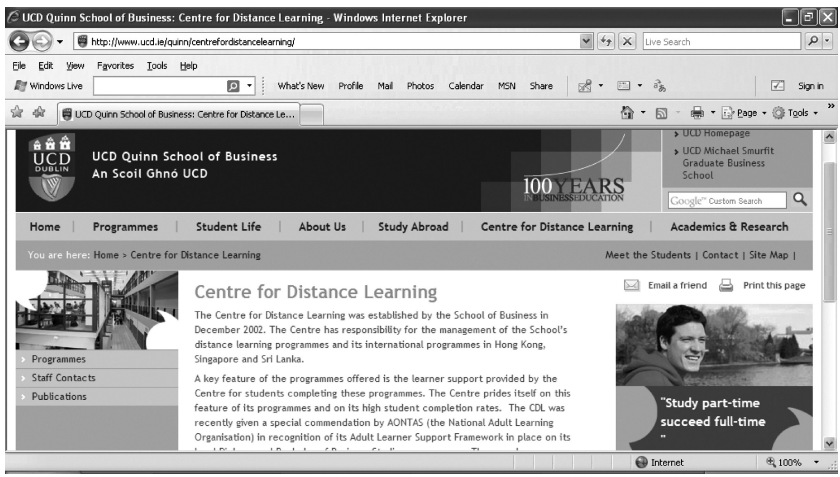

FIGURE 1 The Centre for Distance Learning, UCD Quinn School of Business website

demographic questions, questions relating to the independent study habits of respondents, questions relating to use of information sources (including the university library, elibrary, and VLE), and collaborative information behaviors.

The questionnaire was available, through the web-based survey software, SurveyMonkey.com, to students over a three-week period in May 2008. An overall response rate of 40% was calculated for the current study, that is 55 out of the population of 136 students responded to the survey. Although low, this is an acceptable response rate, particularly considering that the total population, as opposed to a sample, was surveyed.

Findings

Demographic and Background Data

Just over half (52.7%) the respondents were female and (47.3%) were male (this reflects the gender breakdown in the course as a whole, which was 52% female and 48% male), and the majority of respondents (87.3%) were aged thirty or over, while the remaining 12.7% were aged twenty-nine or younger. The majority of respondents (52.7%) lived in Dublin, while 47.3% resided outside the capital.

Table 1 following shows the reasons given by the respondents for taking the course (respondents were asked to tick all that apply).

The distance learning degree program involves home study and some weekend classes throughout the academic year. The students were asked to indicate how much time they spent on

TABLE 1 Reasons for undertaking the course

Reason	%
To obtain degree qualification	76.4
To increase employment opportunities	65.5
Flexible nature of distance learning	63.6
To enhance personal development	61.8
To improve work related skills	43.6
Full time education was not an option	36.4
Other	5.5

TABLE 2 Time spent on independent study

Time	%
Under 3 hrs/wk	9.4
3–5 hrs/wk	28.3
6–8 hrs/wk	28.3
9–11 hrs/wk	13.2
12 or more hrs/wk	20.8

independent study as part of the course, that is, time spent on autonomous learning activities, such as reading and coursework (results shown in Table 2).

Use of Information Sources

The respondents were asked to indicate the information sources they consulted during independent study and for an information search (they could tick multiple sources).

Table 3 shows that for both independent study and for specific information searches, the top three searches used by the students were all web-based. The respondents were then asked to rate a number of electronic sources in terms of usefulness for the course.

The respondents were also asked how they evaluated information sources and judged their validity. The respondents could

TABLE 3 Information sources and services accessed during independent study and for an information search

Source/Service	Independent study %	Rank	Information search %	Rank
Course VLE (Blackboard)	80.0	1	63.6	3
University elibrary	74.5	2	70.1	2
Web search engine	72.7	3	76.4	1
Bookshop	27.3	4	23.6	6
University library	20.0	5	27.3	4
Other library (physical)	20.0	6	18.2	7
Other library (online)	12.7	7	25.5	5
Other	25.4		18.1	

TABLE 4 Ranking of electronic sources

Source	Excellent	Good	Average	Poor	Not relevant
Online database (n = 49)	23.4%	46.8%	23.4%	2.1%	4.3%
Topic specific website (n = 49)	14.3%	55.1%	16.3%	2.0%	12.3%
Web search engine (n = 50)	14.0%	62.0%	24.0%	0	0
University library website (n = 49)	12.2%	53.1%	20.4%	4.1%	10.2%

tick all the answers that applied and also enter their own criteria, under "other" (Table 4).

The final comment on Table 5 makes reference to a "learning support officer." The learning support framework that exists in the Centre for Distance Learning is based on the notion of the centrality of the learner, meaning that the learner is the principal stakeholder in the overall process (Dowling and Ryan, 2007). Essential to this support framework are learning support officers, who play a vital role in the BBS distance learning program. "Because of the non-traditional nature of the learner body

TABLE 5 How students established the validity of information sources

Method	%
Consult the literature	49.1
Ask a lecturer	36.4
Consult the library website	25.5
Ask another student in the course	20.0
Ask another expert in the field	10.9
Ask a colleague	9.1
Ask a librarian	7.2
Other	21.8

Example of the responses provided to 'other' include:

- "Valid sources outlined early on in first year, reiterated by various lecturers, course facilitators";
- "Consult distance learning unit";
- "Many lecturers advise us and give us valid, reliable sources to source info. Experience then will allow one to make a judgement";
- "Valid sources outlined early on in 1st year, reiterated by various lecturers. Course Facilitator"; and
- "I would only consider the validity of a resource on recommendation from a lecturer, or learning support officer."

TABLE 6 How students discovered information sources relevant to the course

Method	%
Recommendation from a lecturer	78.2
University library website	54.5
Recommendation from another student in the course	34.5
Recommendation from a colleague	23.6
Other non-library website	21.8
Other library website	21.8
Recommendation from a librarian	1.8
Other	10.9

the provision of supports to help learners cope with the academic demands of third level education was a primary consideration in the programme's early design" (Dowling and Ryan, 2007, 85). The learning support officers are a first point of contact; they provide both academic and non-academic guidance and act as personal tutors to the students.

The respondents were also asked to indicate the most important sources for discovering course information, as with previous questions they could indicate more than one answer (Table 6).

The respondents were asked if they had experienced any difficulties looking for course information. Many of the students made comments about the difficulty of finding information on the UCD website, the library website, and the physical library (see Figure 2). Their responses to this open-ended question included:

- "Access to the UCD library is good but can be confusing as it is so big to find exactly what you need. Not being a full time student means familiarization and locating reference books takes a large amount of time";
- "UCD can be a bit of a quagmire online, just accessing information in general has been a difficulty at times. Librarians often appear to have barely restrained patience, or too busy. I've asked once for help, person was so brusque, I decided not to go that route again";
- "UCD website is a total nightmare . . . difficult to navigate";

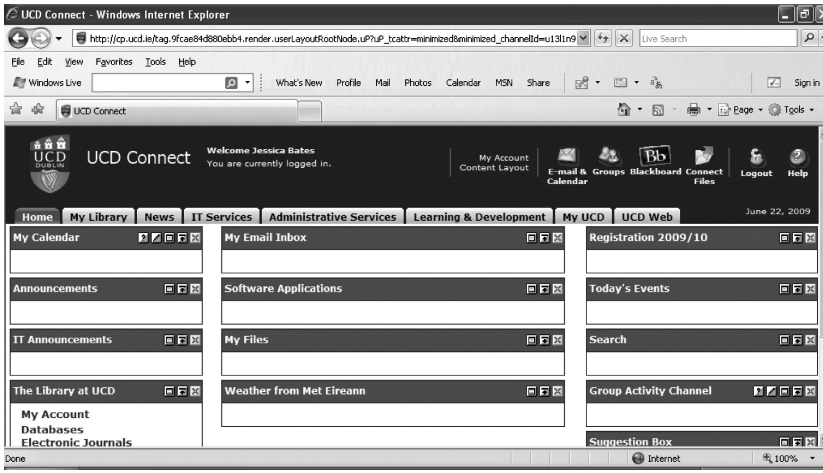

FIGURE 2 Screen shot of the UCD Connect portal

- "UCD website with ucd.ie/blackboard/SIS is a navigational nightmare, including accessing certain databases/journals off-site"; and
- "While there is some information in the James Joyce Library, many of the books, although I have used them, are very old. Most of my information and research is through the internet on recommendations from the Support Officer, Centre for Distance Learning, lecturers and other students."

Use of the VLE

The respondents were asked how often they accessed the VLE, Blackboard (website shown in Figure 3). The majority accessed it at least once a week (60.8%), 23.5% accessed it on a daily basis, and the remaining 15.7% accessed it less often. As shown in Table 7, they were also asked to rate the VLE in terms of usability, accessibility, instructions for use, navigational facilities, and content.

Whereas the majority of students use the VLE on average "once a week," many seem somewhat disillusioned by the service it offers (in terms of navigation options and instructions for use). One respondent suggested there should be a "search" facility to assist with information searching. The respondents were more

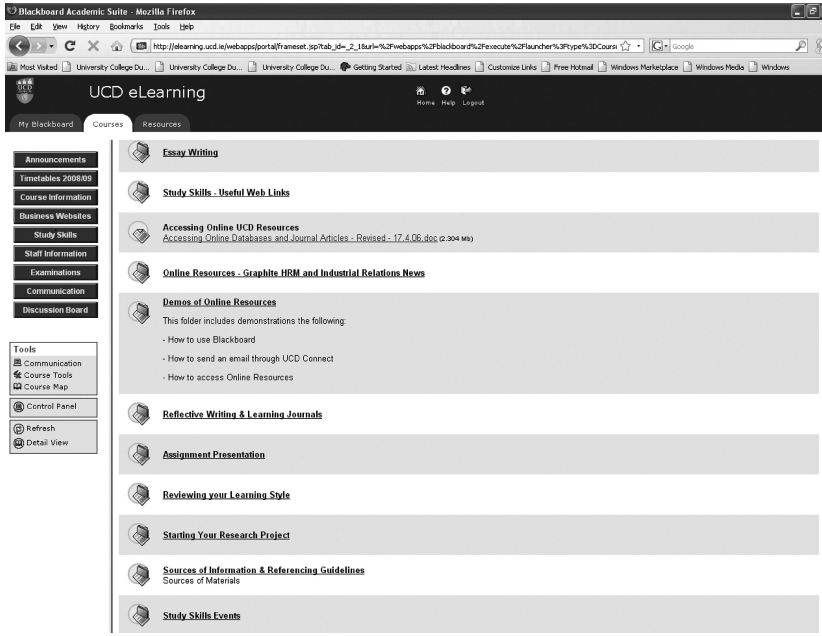

FIGURE 3 Screen shot of the VLE, Blackboard, which is used for the course

positive about it, however, in terms of the actual content that was available.

Collaborative Information Behaviors and Practices

The respondents were asked if they collaborated with other students on the course with regard to both seeking information and sharing information. With regard to the former, the majority of students indicated that they did not collaborate (78.4%), and

TABLE 7 Ranking aspects of the VLE

Source	Excellent	Good	Average	Poor	Not relevant
Usability (n = 51)	7.8%	27.5%	52.9%	9.8%	2.0%
Accessibility (n = 51)	11.8%	37.3%	41.2%	9.8%	0
Instructions for use (n = 51)	0	31.4%	43.1%	23.5%	2.0%
Navigational facilities (n = 51)	0	23.5%	43.1%	33.3%	0
Content (n = 51)	15.7%	51.0%	27.5%	5.9%	0

21.6% said that they did collaborate. In relation to sharing information, 86.0% did collaborate by sharing information, and 14.0% did not.

Scale questions were used to further elicit the respondents' perceptions of collaboration, shown in Table 8.

Students mainly communicated with each other through email and sms texting through a mobile telephone. Table 9 shows the communication methods used by the students in their interactions with each other.

The respondents were also asked how often they collaborated with other students on the course. Just over half of the students indicated that they did so once a week (52.9%), 29.4% said they did so once a month, 7.8% every day, 7.8% once in a semester, and the remaining 2.0% once a year or less.

TABLE 8 Students' perceptions of collaboration

Statement	Strongly agree	Agree	Disagree	Strongly disagree	Undecided
Collaboration with other BBS students enhances the overall learning experience (n = 50)	36.0%	46.0%	4.0%	8.0%	6.0%
Collaboration affords greater understanding of course material (n = 49	34.7%	49.0%	2.0%	8.2%	6.1%
Collaboration provides a vehicle whereby vague aspects of course material can be examined (n = 50)	36.0%	46.0%	2.0%	8.0%	8.0%
Collaboration fosters social interaction (n = 50)	34.0%	52.0%	0	6.0%	8.0%
Collaboration means that I feel like I belong to a class unit (n = 50)	32.0%	48.0%	2.0%	8.0%	10.0%
Collaboration provides a support network (n = 49)	32.7%	51.0%	6.1%	6.1%	4.1%

TABLE 9 Forms of mediated communication used by the students to communicate with each other

Method	%
Email	87.3
Texting	58.2
Social network sites	14.5
Instant messaging	3.6
Internet chat rooms	1.8
Discussion board	0
Blog	0
Other	0

Discussion

What are the Main Sources of Information for the BBS Distance Learning Students?

The findings from this study indicate that BBS students rely on a number of resources to enable them to undertake independent study, to complete course work and also to conduct information searches related directly to their course of study. Both print and electronic resources are used by the students, but there is a general preference for electronic resources. This preference for online sources corresponds with previous research pertaining to the information world of various student groups. A study conducted by Chung and Neuman (2006) concluded that "The interviewed students all responded that the Internet was their first choice among the range of sources to begin their search. Students were familiar with using its search engines" (1509). A report carried out by OCLC (2006) echoes this trend and "The survey findings indicate that 89 percent of college student information searches begin with a search engine" (1–7).

This group of students acquires information from formal sources such as journals and course textbooks, as well as through informal channels. Information from other people plays a significant role in the overall information seeking and retrieval process, and this is conducted through conversations with lecturers, course providers, work colleagues, and classmates. The

influence of lecturers and learning support officers/personal tutors plays a vital and integral part in accessing the validity of a resource for BBS students. This is comparable to the findings of the research undertaken by George et al. (2006) where human interaction and communication formed the basis of the information world of the student group studied. According to the authors "The findings indicate that people, especially academic staff, play a central role" (20).

This research was interested in discovering the most beneficial sources that BBS students have used over the course of their studies and found that there is a strong preference for guidance and help from lecturers, as well as using the Internet. A sample of some of the answers given is outlined below:

- "The lecturers—knowledge of key researchers on which they base course material";
- "From lecturers and support officers from the Centre for Distance Learning. Also from fellow students";
- "Internet, easy and fast access"; and
- "Online search engines as they provide a vast amount of information, which, if not sufficient in itself, will usually lead to other relevant information. Often the search engine will offer much of the same information as the online UCD database so I often use the search engine first and the UCD database second."

What are Student Perceptions of the Virtual Learning Environment (VLE), Blackboard, Eemployed by the Quinn School of Business?

The respondents were regular users of the course VLE (with 84.3% accessing Blackboard at least weekly). While students were generally satisfied with the content available within the VLE, the study found that there were some issues around navigation. However, as is discussed in the following conclusion, the perceived problems that the respondents had were more to do with navigating within a broader portal that offers access to, what for some students is, a confusing array of resources and applications (such as email, the elibrary, Blackboard, administrative systems, online storage etc.), than with navigating specifically within Blackboard, and the student comments in particular reflect this.

To What Extent, If Any, is There Evidence of Collaborative Information Behaviors and Practices?

The study found that the students consulted with one another while working on the course, particularly in terms of information sharing. Beldarrain. (2006) suggests that student interaction is a key component of successful distance learning programs and asserts that "The added control and interaction provided to learners using technology tools may help tap into a student's expertise, and promote collaboration through peer-to-peer mentoring, teamwork, and other strategies" (144).

This theme of human interaction and collaboration is not just confined to the exchanges between students themselves but also includes the communication and relations that exist between students and lecturers, and between students and learning support officers. As previously outlined, there are strong lines of communication between these groups, and the BBS students rely significantly on support and information from both lecturers and learning support officers. Thus, as can be seen from the current study, the major stakeholders involved in the successful implementation and smooth running of a constructive information world for the BBS students are lecturers and learning support officers; there was little mention of the support provided by librarians in the overall process.

Conclusion

There is a need to support collaborative, peer-to-peer information sharing and learning. To date, the primary means of mediated communication between the students surveyed is private one-to-one communication (through email and mobile phone texting). Students need the support to utilize the VLE so that they can learn from each other. The collaborative practices that are evident from this study (student-lecturer; student-learning support officer; student-student; and to a lesser extent, student-librarian) could be integrated within the VLE and involve greater use of discussion forums, electronic whiteboards, chat rooms, and private emails/messages. Blogs, social network sites, and other web 2.0 resources and applications may also be appropriate. (The

UCD Quinn School, earlier this year, set up a student-led blog: http://ucdblogs.org/quinnschool.)

It is clear, however, that students still value the library as a resource, even though it has been overshadowed somewhat by the internet. This theme is echoed in the OCLC report of 2006 where it is suggested that "As more and more content becomes digital and accessible via the Internet, the number of information sources available for both information discovery and validation is likely to increase, fueling increased confidence and self-reliance" (6–4). The report goes further to suggest that many students "use the library less since they began using the Internet. Verbatim comments reveal strong attachments to libraries as places, but many of these positive associations are nostalgic in nature, and are not related to current experiences" (6–4). It is not surprising that the elibrary is used more than the physical library by this cohort of students and as the university library develops as a hybrid of both physical and electronic sources, it is important that collaboration between the library and faculties and specific courses/programs is ongoing.

It is essential that librarians take steps to have a more active role in the information behavior of students. Information literacy is a key element in this process, and librarians need to ensure that all students are given the opportunity to obtain instruction on seeking and retrieving information, as well as being given the tools to decipher if an information source is a valid and reliable one. Librarians need to work alongside other key stake holders in the process like lecturers and learning support officers, to ensure that all students are given access to these tools. As indicated on the Information Literacy website "Information literacy skills allow library and information professionals to create, develop and manage a library or information unit which meets the specific information needs of their organization" (Information Literacy website).

Information seeking and retrieval are essential skills for BBS students. In order to have the necessary skills to do this successfully, BBS students need to be given clear instruction and training with regard to information seeking and evaluation of sources. Many students expressed difficulty with regard to ascertaining whether a source they have located is a valid and reliable resource, and in order to establish this, they would ask a lecturer. Students should be given the tools to make this distinction

themselves. There is potentially a strong role for the university library in this regard.

As BBS students generally take direction from lecturers and learning support officers, these key stakeholders themselves should be given clear instruction with regard to seeking and retrieving information, so that they are fully aware of all varieties of information channels. Again, the university library, possibly in conjunction with the university teaching and learning unit, could drive this.

Librarians also need to take an active role in assisting students as they go about their information seeking and retrieval. As indicated in the findings of this study, librarians do not play a visible role in the information behavior of the BBS students. It is hoped that future research could be conducted in this area to explore how this relationship could be further developed.

Finally, many students expressed difficulties with regard to finding information on the main UCD library website. It is hoped that in light of these findings changes could be made so as to improve navigation facilities. It is recommended that further research be conducted in this area.

What emerges from this study is that students can face confusion over how to navigate the university's online resources. The VLE is embedded within a broader MLE (Managed Learning Environment), that is an integrated system providing access to the VLE; to email; the elibrary, library catalogue, and library records; online storage space; administrative records; software applications, etc. As Forsyth (2003) notes, "A VLE will become an MLE if it is integrated with existing information technology systems – that is, the main campus network, email, library, student records and other online resources – and if a single username and password will sign the user on to all of these systems at once" (134). This is the case for the students in UCD, and for the students surveyed; the more that services, resources, and applications are integrated within the one system, the more likely the scope for potential confusion and navigational difficulties it would seem. However, it is not clear what the solution is, as having multiple web pages and logins for the various resources and services is not desirable either. What does emerge from this study is that the distance learning students surveyed are not as technologically literate as one might assume (particularly when they move beyond

Google). Mellon (1986), Katopol (2005), and others, have written about information anxiety, which Katapol describes as "lost in an unfamiliar information world" (238) and "powerless ... due to an inability to navigate the library" (235). Although this has in the past been applied to physical libraries, and mainly in educational contexts, the concept can also be applied to online environments. When faced with a complex online environment, it would seem students are opting often for a search engine, rather than navigating through the MLE to the elibrary, and on to database searches and full-text journal articles. Williams and Rowlands (2007) have pointed out that "the speed of new media has cultivated a lower tolerance of delay" when it comes to student information seeking (17). As this study shows, further targeted support for students, so that they can effectively utilize (and evaluate) online resources and tools is as important as ever.

As a VLE develops into an MLE and provides access to a range of services through an integrated platform, there is a danger that library services can get lost. There is certainly evidence that this may be happening from this study. It is clearly more convenient to have one central login to a range of resources; however, there needs to be greater awareness of how students are navigating (or not) through this information space. This is an important area for further study.

As resources become more integrated (at entry point anyway), good communication and collaboration between (and within) the university library, IT services, faculties, schools, and programs and other units within the university, in terms of the infrastructure, site navigation, and content, is critical.

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