Students' perceptions toward the use of the digital library in weekly web-based distance learning assignments portion of a hybrid programme

Alex Koohang

Dr Alex Koohang is an associate professor and director of undergraduate program in the School of Information Studies at University of Wisconsin–Milwaukee, USA. Dr Koohang has designed, developed, and implemented various traditional, non-traditional, hybrid, and online courses/programmes. He has been involved in the development of online education, having initiated and administered some of the earliest asynchronous learning networks. His current research interests are in the areas of distance/e-learning, usability, and information architecture. Address for correspondence: Dr Alex Koohang, University of Wisconsin–Milwaukee, School of Information Studies, Bolton Hall, PO Box 413, Milwaukee, WI 53201, USA; email: koohang@uwm.edu

Abstract

This study attempted to investigate students' perceptions toward the use of the digital library in weekly web-based distance learning assignments portion of a hybrid instructional programme. Attention was given to three variables—age, gender, and prior experience with the Internet. A Likert-type instrument consisting of 10 items was designed to collect information about students' perceptions toward the use of digital library. The subjects of this study were 154 students enrolled in an undergraduate hybrid programme in management at a medium-sized university in the Midwest, USA. Collected data were analysed using ANOVA. The overall results suggest that students had positive perceptions toward the use of the digital library. Age was found to be an insignificant factor. However, gender and prior experience with the Internet were found to be significant factors. Males had significantly higher positive perceptions toward using the digital library. Students who had more prior experience with the Internet had significantly higher positive perceptions toward using the digital library. Implications for practice are discussed and recommendations are made for future research.

Keywords: digital library, virtual library, e-library, hybrid instructional model, hybrid programme, web-based distance learning, adult learners, perceptions, gender differences, Internet experience.

Introduction

Distance learning implies all types of formal instruction where teachers and students are not located in the same place (Gilbert, 1995). Distance learning has advanced
through the assistance of technology using various types of delivery that have included telephone conferencing, video conferencing, email correspondence, and web-based distance learning via the Internet.

One of the most appealing elements in web-based distance learning is the ability to teach/learn anywhere, anyplace, anytime (Downes, 1998; Cooper, 1999; Gubbins, Clay, and Perkins, 1999; Rose, 1999; Seymour, Durante, and Koohang, 1998). Apparently, this has made the web-based distance learning very attractive among students, particularly the adult learners (Thomson, 1988).

Research continues to document that web-based distance learning is a satisfying experience for students (Carey and Gregory, 2002). Students also appear to have positive perceptions toward the Internet in general and its effect on their educational experience (Jones, 2002). Because of its attractiveness, web-based distance learning has gained enormous interest and attention in recent years. Higher education institutions continue to find efficient methods to include web-based distance learning into the real classroom experience. Young (2002) reported that an increasing number of universities are incorporating web-based distance learning into the conventional classroom instruction. This type of instruction is known as the hybrid instructional model. The hybrid instructional model is a combination of conventional face-to-face instruction and web-based distance learning. The hybrid instructional model is becoming more accepted among faculty and students. It provides the best features of both face-to-face instruction and distance learning. It encourages increased active independent learning and lessens class seat time (Young, 2002; Garnham and Kaleta 2002).

The setting of the study

The hybrid programme

The present study took place in an undergraduate hybrid programme in management. This programme was designed for working adults. Each course in the programme consisted of both conventional face-to-face instruction and web-based distance learning. Because of its accelerated nature, this programme required that students meet face-to-face one night per week. This satisfied the conventional face-to-face instruction portion of the hybrid programme that included mini-lectures, learning with cases, group activities, and classroom discussion. In addition to conventional face-to-face instruction, students were expected to complete their weekly web-based distance learning assignments via the Internet outside the classroom using a popular courseware known as WebCT. This satisfied the weekly web-based learning portion of the hybrid programme that included writing brief research papers using of the digital library.

The use of a digital library in web-based distance learning assignments

The use of the digital library was designed into and required for writing brief research papers for the weekly web-based distance learning assignments for all courses within the programme. An example of an assignment for one of the courses was text chapter readings that dealt with basic motivation concepts and applications. The assignment required students to use the digital library to find 3 to 5 articles from the literature that
relate to this topic as the minimum requirement for a subsequent brief research paper of approximately 500–700 words. Students were asked to go beyond summarising the articles. They were asked to integrate their content and use American Psychological Association (APA) formatting for citations. The final paper was posted to the discussion forum on the WebCT courseware.

The digital library

The Association of Research Libraries (ARL) has adopted a definition for the digital library that was originally developed by Drabenstott (1994). The definition includes the following:

- the digital library is not a single entity;
- the digital library requires technology to link the resources of many;
- the linkages between the many digital libraries and information services are transparent to the end users;
- universal access to digital libraries and information services is a goal; and
- digital library collections are not limited to document surrogates: they extend to digital artifacts that cannot be represented or distributed in printed formats.

Leiner (1998, Definition section, ¶6) describes the digital library as ‘the collection of services and the collection of information objects and their organization, structure, and presentation that support users in dealing with information objects available directly or indirectly via electronic/digital means.’

The terms virtual libraries, online libraries, and electronic libraries are often used simultaneously and/or interchanged with the term digital libraries (Watstein, Calarco, and Ghaphery, 1999).

The digital library used by students for the weekly web-based distance learning assignments portion of the hybrid programme in the present study was a virtual library. It was a subset of the actual physical library. It could be accessed via the Internet using computers and computer networks. Specifically, the digital library included a large number of databases that contained digital full-text scholarly journals and magazines of all types. It also included digital full-text electronic journals and a multitude of resources on the web for doing research. Other features of the digital library included online catalogues for finding books and periodical lists, a comprehensive online tutorial and asynchronous email support. Students enrolled in the hybrid programme were required to attend a short library orientation session at the beginning of the programme.

Unquestionably the library plays an important role in designing curriculum for web-based distance learning. The use of the digital library should be one of the most important elements in designing a web-based distance learning curriculum. The Association of College and Research Libraries (ACRL) guidelines for distance learning library services (ACRL, 2003, Philosophy section, ¶1) regarding the use of the library in distance learning.
learning state that ‘Access to adequate library services and resources is essential for the attainment of superior academic skills in post-secondary education, regardless of where students, faculty, and programs are located.’

One of the most precious elements of a higher institution of learning is its library. The library is the key to an institution’s academic strengths. For faculty and students alike it is at the core of inquiry. The library is the heart and soul of the learning process. In a traditional face-to-face course many educators tend to design some classroom activities, assignments, and/or the course paper(s) around the library. For example, a term paper assignment may require students to use the library to conduct a review of literature specifying a minimum number of sources. This gives students the experience of moving beyond popular publications in order to delve into more substantive material to help them pursue the topic of their paper. Similarly, this type of assignment should be an important element in a web-based distance learning course.

However, given the relative newness of web-based distance learning, early entrants into this educational medium were unlikely to have incorporated direct library research, particularly since electronic sources and full-text sources were less available then. Many early approaches to distance education put emphasis on mastering the medium via web-based learning tools companioned with a textbook. Lebowitz (1997) stated that much of the distance learning literature dealing with distance delivery for the distance learners includes very little reference to the use of libraries or library resources. With the increasing interest by higher education accrediting agencies in requiring certain levels of library support and information needs for distance learning programmes, educators should be encouraged to include the use of the library in their course designs (Seymour, Durante, and Koohang, 1988).

**Purpose of the study**

This study focuses on the use of the digital library in the web-based distance learning portion of the hybrid programme described at the beginning of this paper. The purpose of this study was to investigate students’ perceptions towards the use of the digital library that was used as the main resource to write the weekly brief research papers required for the distance learning portion of the hybrid programme. Students’ perceptions towards the use of the digital library may be an important factor in influencing a positive learning outcome. Differences in students’ perceptions toward the use of the digital library are examined using three variables—age, gender, and prior experience with the Internet.

Age is selected because the literature has shown that the adult population comprises a large proportion of all web-based distance learners (Thomson, 1988). Therefore, it is important to find whether perception differences exist within different age categories. Gender is selected because gender differences have been documented in the literature as affecting perception (Hackett, Mirvis and Sales, 1991). As a result, it is imperative to find whether gender differences exist between male and female respondents. Research has documented that the amount of experience is significantly related to user
Students’ perceptions toward the use of the digital library

acceptance of technology in general (Koohang, 1989). The more experience a user has with the technology the more he or she tends to accept it. Therefore, this variable was selected to find whether increased experience with the Internet affects students’ perceptions toward the use of the digital library for writing brief research papers.

Methodology

Instrument

A Likert-type instrument consisting of 10 items was designed to measure students’ perceptions toward the use of the digital library for writing brief research papers in the weekly web-based distance learning portion of the hybrid programme. The items are shown in Table 1. The instrument represented positively worded statements that collect information about students’ perceptions towards the use of the digital library for writing brief research papers in the weekly web-based distance learning portion of the hybrid programme.

The validity of the instrument was determined by a panel consisting of four university professors whose expertise was in the fields of information technology, information science and organisational behaviour. The items of the instrument were chosen from an original pool of 17 items. It was the consensus of the panel to eliminate seven items and modify several for accuracy and clarity. The final instrument resulted in 10 positively worded statements that measure students’ perceptions toward the use of the digital library for writing brief research papers in the weekly web-based distance learning portion of the hybrid programme. The responses to the items were recorded as follows: strongly agree = 5, agree = 4, neither agree nor disagree = 3, disagree = 2, and strongly disagree = 1.

Table 1: The items of the instrument

1. The digital library used for weekly web-based distance learning assignments is a valuable tool.
2. By using the digital library I often found materials relevant to what I wanted for my weekly web-based distance learning assignments.
3. My time is well spent using the digital library for weekly web-based distance learning assignments.
5. I am motivated every time I use the digital library for weekly web-based distance learning assignments.
6. Using the digital library increases my ability to do a better job for weekly web-based distance learning assignments.
7. Using the digital library for weekly web-based distance learning assignments is an important part of the learning process.
8. It is worthwhile using the digital library for weekly web-based distance learning assignments.
9. I feel that I gain a lot by using the digital library for weekly web-based distance learning assignments.
10. It is a rewarding experience to use the digital library for weekly web-based distance learning assignments.

The instrument was tested for reliability using 47 subjects independent of the sample of respondents used in the study itself. These subjects were enrolled in an undergraduate hybrid programme in management. The coefficient alpha reliability from the results was 0.92. This suggests that the instrument is stable enough to determine students’ perceptions towards the use of the digital library for writing brief research papers in the weekly web-based distance learning portion of the hybrid programme.

Subjects
The subjects of this study were 154 students who were enrolled in an undergraduate hybrid programme in management. The subjects were from five different campuses at a medium-sized university in the Midwest, USA. All subjects had completed at least six assignments that required the use of the digital library for writing brief research papers for their web-based learning portion of the hybrid programme. The subjects were 48.1 per cent males and 51.9 per cent females who were primarily working adult students. Completion of web-based distance learning assignments was a required part of the programme that accounted for 50 per cent of students’ final grades. The instrument was administered on-site to students enrolled in the hybrid programme. The purpose of the study and the scoring strategy was carefully explained to the subjects. They were assured that their responses would be anonymous and confidential.

Research questions
This study was designed to answer the following questions:

1. Is there a difference in perceptions among various age levels (1 = 21–30, 2 = 31–40, and 3 = over 40) of the subjects using the digital library?
2. Is there a difference in perceptions between males and females using the digital library?
3. Is there a difference in perceptions among the levels of prior experience with the Internet (1 = 1–2 years, 2 = 3–5 years, and 3 = over 5 years) of the subjects using the digital library?

Data analysis
Analyses of variance (three separate ANOVAs) were conducted to answer the research questions. The $F$ statistics generated from the analyses indicate significant differences between the selected variables and students’ perceptions toward the use of the digital library in their web-based distance learning assignments portion of the hybrid programme. A predetermined level of significance (alpha = 0.05) was chosen for this study.

Results
The results of the descriptive analyses indicated that overall students perceived that the use of the digital library in the web-based distance learning assignments portion of the hybrid programme was a positive learning experience. (See Table 2)

The results of ANOVA for age indicated no significant difference in perceptions among various age levels of the subjects using the digital library in their weekly web-based
Students’ perceptions toward the use of the digital library

distance learning assignments ($F_{1,151} = 0.204, p = 0.816$). Mean scores are presented in Table 3 which can be found in Appendix A.

The results of ANOVA for gender yielded a significant difference in perceptions between males and females using the digital library in their weekly web-based distance learning assignments ($F_{1,152} = 4.278, p = 0.040$). Male students scored significantly higher than females did. Mean scores are presented in Table 3.


### Table 2: Descriptive statistics

<table>
<thead>
<tr>
<th>Item #</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item #1</td>
<td>154</td>
<td>2</td>
<td>5</td>
<td>3.91</td>
<td>0.873</td>
</tr>
<tr>
<td>Item #2</td>
<td>154</td>
<td>2</td>
<td>5</td>
<td>3.88</td>
<td>0.885</td>
</tr>
<tr>
<td>Item #3</td>
<td>154</td>
<td>2</td>
<td>5</td>
<td>3.94</td>
<td>0.887</td>
</tr>
<tr>
<td>Item #4</td>
<td>154</td>
<td>2</td>
<td>5</td>
<td>4.00</td>
<td>0.840</td>
</tr>
<tr>
<td>Item #5</td>
<td>154</td>
<td>2</td>
<td>5</td>
<td>3.69</td>
<td>0.959</td>
</tr>
<tr>
<td>Item #6</td>
<td>154</td>
<td>2</td>
<td>5</td>
<td>3.77</td>
<td>0.982</td>
</tr>
<tr>
<td>Item #7</td>
<td>154</td>
<td>1</td>
<td>5</td>
<td>3.81</td>
<td>0.984</td>
</tr>
<tr>
<td>Item #8</td>
<td>154</td>
<td>2</td>
<td>5</td>
<td>3.83</td>
<td>0.976</td>
</tr>
<tr>
<td>Item #9</td>
<td>154</td>
<td>2</td>
<td>5</td>
<td>3.77</td>
<td>0.934</td>
</tr>
<tr>
<td>Item #10</td>
<td>154</td>
<td>1</td>
<td>5</td>
<td>3.74</td>
<td>0.995</td>
</tr>
</tbody>
</table>

### Table 3: Means and standard deviations

<table>
<thead>
<tr>
<th>Age</th>
<th>Mean</th>
<th>N</th>
<th>Per cent</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>21–30</td>
<td>3.8150</td>
<td>60</td>
<td>39.0</td>
<td>0.80839</td>
</tr>
<tr>
<td>31–40</td>
<td>3.8857</td>
<td>56</td>
<td>36.4</td>
<td>0.70128</td>
</tr>
<tr>
<td>Over 40</td>
<td>3.7868</td>
<td>38</td>
<td>24.7</td>
<td>0.88811</td>
</tr>
<tr>
<td>Total</td>
<td>3.8338</td>
<td>154</td>
<td>100.0</td>
<td>0.78817</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Mean</th>
<th>N</th>
<th>Per cent</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>3.9689</td>
<td>74</td>
<td>48.1</td>
<td>0.63933</td>
</tr>
<tr>
<td>Female</td>
<td>3.7087</td>
<td>80</td>
<td>51.9</td>
<td>0.89020</td>
</tr>
<tr>
<td>Total</td>
<td>3.8338</td>
<td>154</td>
<td>100.0</td>
<td>0.78817</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prior experience with the Internet</th>
<th>Mean</th>
<th>N</th>
<th>Per cent</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–2 years</td>
<td>3.2389</td>
<td>18</td>
<td>11.7</td>
<td>0.92998</td>
</tr>
<tr>
<td>3–5 years</td>
<td>3.8583</td>
<td>48</td>
<td>31.2</td>
<td>0.76876</td>
</tr>
<tr>
<td>Over 5 years</td>
<td>3.9420</td>
<td>88</td>
<td>57.1</td>
<td>0.72027</td>
</tr>
<tr>
<td>Total</td>
<td>3.8338</td>
<td>154</td>
<td>100.0</td>
<td>0.78817</td>
</tr>
</tbody>
</table>
The results of ANOVA for prior experience with the Internet showed a significant difference in perceptions among various Internet experience levels of the subjects using the digital library in their weekly Web-based distance learning assignments ($F_{2,151} = 6.403, p = .002$). Subjects who had more prior experience with the Internet scored higher. Mean scores are presented in Table 3.

**Discussion**

Digital libraries are rapidly gaining attention in digital learning communities, especially, distance education. A digital library can provide learners with access to information anytime, anywhere, and anyplace in any format. For this reason, digital libraries can be a great addition to distance learning. This study attempted to examine students’ perceptions toward the use of the digital library in the weekly web-based distance learning assignments portion of the hybrid programme.

The overall results suggested that students had positive perceptions toward the use of the digital library. The results of ANOVA showed no significant differences in perceptions among various age levels of the subjects using the digital library in their weekly web-based distance learning assignments. This means that all age groups had equally perceived that the use of the digital library was a positive learning experience.

ANOVA for gender reported a significant difference in perceptions between males and females using the digital library. Male students scored significantly higher than female students did. This means that male students had higher positive perceptions towards the use of the digital library.

Blum (1999) reported that male students appear to dominate the online learning environment. They are inclined to demonstrate a higher confidence level towards online learning than female students do. In the present study females scored significantly lower than males did. This suggests that female students may have had difficulty with lower confidence levels. The lower confidence level may create barriers that limit the opportunities and choices for female students in achieving a positive academic learning experience.

Using the digital library inherently requires some technical skills and a degree of confidence. Therefore, this study recommends that students, especially females, be provided with special hands-on training that is uniquely geared towards their learning styles when dealing with the use of digital libraries in their web-based distance learning assignments. This may help increase their confidence levels towards the use of the digital library. In addition, higher education institutions offering distance learning programmes—either stand-alone, or as a part of the hybrid model—must make every effort to create a learning environment that provides suitable opportunities and choices for female students in order to promote their confidence levels. Gender differences in relation to the use of the digital library merit further investigations in future research.

The results of ANOVA for those with prior experience with the Internet indicated a significant difference in perceptions among various levels of the subjects using the
Students’ perceptions toward the use of the digital library

digital library. Students who had more prior experience with the Internet had higher positive perceptions towards using the digital library in their weekly web-based distance learning assignments. In other words, students with more prior experience with the Internet had a more positive learning experience towards the use of the digital library.

This finding points to an important area that can influence the incorporation of digital library use in web-based teaching and learning. This area is the students’ indicated merits of the use of the digital library in their web-based courses. The association of the virtual classroom and the digital library as parallel media may help students connect the learning environment with the research environment in a seamless way, giving way to perceived benefits. In the use of both web-based interactions, students may move or advance easily and efficiently from one segment to another and find relationships of ideas and concepts within the material that satisfy the purposes of their assigned inquiry. The online access has created the expectation for facility and ease of information in all its uses, particularly outside education; those students with longer experience with the media indicate greater perceived benefits. In this study, 57.1 per cent of the sample claim prior experience with the Internet in excess of five years. Given that the popular browser used to explore the Internet has been widely available only since about 1995, these individuals could be regarded as veterans in personal technology application. It is likely, as well, that these students will have longer experience with the use of stand-alone computers for their daily work. The second largest group in this sample, about 31.2 per cent has a minimum of three years experience. Combined, the two largest groups in this study make up 88.3 per cent of the subject pool. The students with longer experience had higher scores. This may suggest that these subjects had greater perceived benefits. From this, it becomes more evident that the inclusion of assignments that require the use of the digital library for doing research should become a frequent element in web-based courses as an increasing number of students become more experienced and more sophisticated in electronic communication. Therefore, this study recommends that the digital library be incorporated as an essential part of web-based distance learning assignments. Furthermore, as web-based distance learning grows in popularity—either as a stand-alone distance learning or a hybrid instructional model—higher education institutions should support and implement digital libraries to acknowledge in a commensurate way the inclusion of web-based distance learning programmes that rely on digital library access and web-mediated instruction.

This study is not without limitations. Perhaps, future research should focus on a different population sample and refinement/improvement of the instrument. The research in the area of the digital library in general is in its infancy. There is much to be done to enhance and improve digital libraries. Standardisation and usability issues of digital libraries are beginning to surface. Currently, digital libraries are not following a standard model for retrieving information and many of them have problems regarding system usability. Absence of standardisation and usability may influence learners’ negative perceptions toward the use of digital libraries. Therefore, these variables deserve attention in future research.

References


