Factors Affecting the Adoption of Online Library Resources by Business Students

Lorne Booker
DeGroote School of Business, McMaster University, Hamilton, ON, Canada., ldbooker@lakeheadu.ca

Brian Detlor
McMaster University, Hamilton, ON, Canada., detlorb@mcmaster.ca

Alexander Serenko
Faculty of Business Administration, Lakehead University, Thunder Bay, ON, Canada., aserenko@lakeheadu.ca

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Lorne D. Booker
McMaster University
ldbooker@lakeheadu.ca

Brian Detlor
McMaster University
detlorb@mcmaster.ca

Alexander Serenko
Lakehead University
aserenko@lakeheadu.ca

ABSTRACT

The goal of this study is to explain how information literacy instruction (ILI) influences the adoption of online library resources (OLR) by business students. ILI was measured in terms of the amount of overall, active, and passive ILI received. A theoretical model was developed and tested by means of a survey of 337 business students, which included both closed and open-ended questions. Findings indicate that the ILI received by students is beneficial in the initial or early stages of OLR use; however, students quickly reach a saturation point where more instruction contributes little to the final outcome, such as reduced OLR anxiety and increased OLR self-efficacy. Rather, it is the independent, continuous use of OLR after receiving initial, formal information literacy instruction that creates continued positive effects. OLR self-efficacy and anxiety are important antecedents to OLR adoption. OLR anxiety partially mediates the relationship between self-efficacy and perceived ease of use.

Keywords

Information literacy instruction, library, anxiety, self-efficacy, technology acceptance model.

INTRODUCTION

Information is a vital resource for businesses and organizations today. The ability of knowledge workers to find, retrieve, analyze and use information, both effectively and efficiently, is seen as a necessary set of skills for employees to have. Collectively, these abilities are known as information literacy (IL) skills.

Business schools recognize the explicit need to train their students how to locate, access, and interpret information from a wide variety of information sources. They know that their students will need to utilize information for knowledge-building and decision-making purposes after they graduate. For that reason, business schools are placing more emphasis on training their students to be proficient at utilizing information technology tools that provide access to electronic information sources; many such sources are available through the university's online library resources (e.g., databases, indexes, journal suites, online catalogues, library portals, etc.) The teaching of information literacy skills is called information literacy instruction (ILI). In business schools, ILI is usually tied to instruction on the use of Online Library Resources (OLR).

OLR are the content stored in digital library repositories and the information systems that allow people to search and retrieve that content. OLR include any items accessible by electronic means through academic library websites, as well as the technology that makes those items accessible. Examples of OLR include the online library catalogue, the library website itself, digital books, electronic journals and articles, online magazines, online newspapers, theses and dissertations in digital form, and electronic databases such as Business Source Complete, Factiva, and Web of Science.

Though business schools are keen to offer ILI to their students, the best way to go about this is unclear. Several factors that influence student learning outcomes of ILI in business schools have been identified, but more research is needed to demonstrate and validate the causality of these factors (Detlor et al., 2011). Of particular interest is the influence of the

amount of overall, active, and passive ILI received on the adoption and use of OLR. Little research has been conducted that compares the efficacy of active ILI with the efficacy of passive ILI in influencing OLR use.

Universities have invested large sums of money to obtain and maintain OLR. In 2008, academic libraries in the United States spent approximately $1 billion on subscriptions to electronic serials and $133.5 million on e-books (Phan et al., 2009). Yet, many students eschew the use of OLR in favor of less credible but easier to find internet-based resources (Davis and Cohen, 2001). Although the adoption of OLR by students is considered important, the factors that influence adoption are not well understood. Previous studies have investigated the adoption and use of library websites and digital libraries, technical aspects of the system interface (Ramayah, 2006), and individual differences (Ramayah and Aafaqi, 2004) – not OLR specifically. None have assessed the efficacy of active and passive modes of ILI on the adoption of OLR. There has been a call for research that identifies which training method is most effective at influencing technology adoption (Venkatesh and Bala, 2008).

Given the above, this study seeks to answer the following research question: What is the impact of ILI on the adoption of OLR by business students?

LITERATURE REVIEW, MODEL AND HYPOTHESES

One of the key outcomes of ILI is the use of OLR. The Technology Acceptance Model (TAM) is the most widely used model for explaining and predicting the adoption and use of information technologies. It suggests that behavioral usage intentions are influenced by two key variables: perceived usefulness, defined as "the degree to which a person believes that using a particular system would enhance his or her job performance," and perceived ease of use, defined as "the degree to which a person believes that using a particular system would be free of physical and mental effort" (Davis, 1989, p. 320). Perceived use of use also affects perceived usefulness.

TAM has many characteristics that make it popular. It is simple yet robust, versatile and extensible (Legris et al., 2003). Although the TAM-based work could fill volumes, there are opportunities for more research. To date, no study has investigated ILI as a predictor of the adoption of OLR.

An important area warranting investigation is the application of active vs. passive ILI. The active instruction approach is founded on the belief that teaching is more effective when students are active participants in the learning process (Bonwell and Eison, 1991). Active instruction requires students to do more than passively listen to information; instead, students engage in reading, writing, analyzing, synthesizing, evaluating and discussing that require the use of higher order thinking skills.

Passive instruction, associated with traditional classroom teaching, views learning as a process of acquiring knowledge. The instructor's job is to communicate principles and conclusions (Whetten and Campell Clark, 1996). The teacher delivers information verbally and supplements lectures with text presented on a blackboard or PowerPoint slides. Regrettably, the influence of these two modes of ILI on learning outcomes is not fully understood. No prior study modelled the influence of these two modes on the adoption of OLR. There is a need for research which compares the efficacy of active ILI with the efficacy of passive ILI.

In addition to the amount and mode of ILI, OLR self-efficacy and OLR anxiety are important variables that serve as antecedents to TAM constructs. Self-efficacy is "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Self-efficacy is not a universal phenomenon that applies to every situation nor is it a phenomenon for which a general measure can be used. An individual can have a high level of self-efficacy in one domain and a low level of self-efficacy in another. Therefore, "scales of perceived self-efficacy must be tailored to the particular domain of functioning that is the object of interest" (Bandura, 2006, p. 307-308). Accordingly, OLR self-efficacy is an individual's beliefs in his/her capabilities to organize and execute the courses of action required to utilize OLR.

Self-efficacy plays an important role in determining performance outcomes and success in learning. For example, self-efficacy has an effect on work performance improvement (Stajkovic and Luthans, 1998) and engagement in academic activities (Moos and Azevedo, 2009). Therefore, improvement in self-efficacy is a desirable learning outcome that may be achieved by means of ILI.

OLR anxiety has not been studied before but two closely related forms of anxiety have been documented. First, computer anxiety, which is the fear or apprehension experienced by a person when using computers or when considering computer use, has been studied quite extensively. Second, library anxiety – defined as negative feelings about using an academic library

(van Scoyoc, 2003) – has received quite a bit of attention. Since people are known to be anxious about using computers and libraries, it is natural to expect that individuals will be anxious about using online library resources. Therefore, OLR anxiety is defined as a marked and persistent fear cued by the use of OLR or the anticipated use of OLR which causes the use of OLR to be avoided or endured with distress.

Based on the extant literature, the following model is suggested (Figure 1). TAM is represented by three constructs - perceived usefulness, perceived ease of use and intention to use OLR – and three paths.

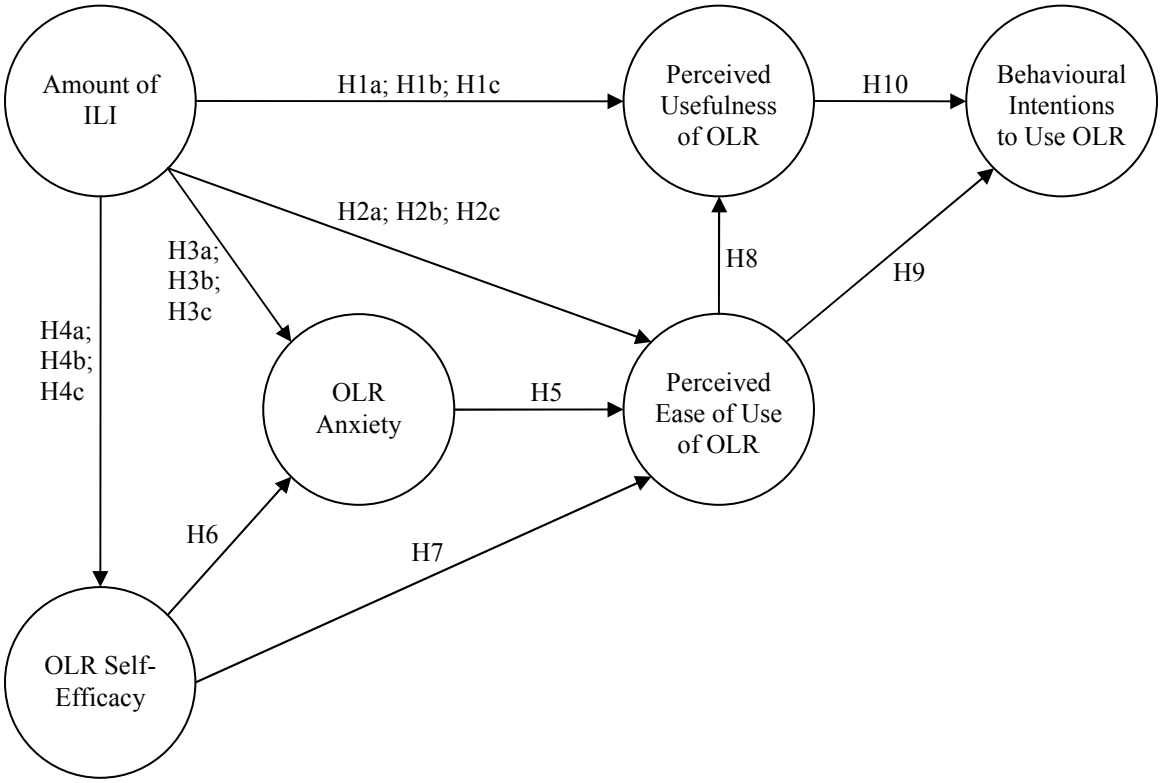

Figure 1. The Proposed Model

In this model, ILI influences OLR adoption through perceived usefulness and perceived ease of use. Students will perceive a technology to be more useful after they have been shown all of the benefits that the technology provides. For example, when students have been demonstrated all of the features of OLR, and all of the information contained in the various databases, they should find OLR more useful. Instruction that is designed to facilitate the use of a technology will cause students to perceive the technology easier to use. The research model presents these ideas as relationships between the amount of ILI and the perceived usefulness of OLR, and between the amount of ILI and perceived ease of use of OLR. In addition, different instructional methods are not equal in their influence upon outcome variables. Whereas some students may prefer a traditional, passive instructional mode, some benefit dramatically when they actively engage in the learning process (Chou, 2001). In this study, ILI is measured in terms of the amount of overall, active, and passive instruction received:

H1a: *The amount of overall ILI received has a positive direct effect on perceived usefulness of OLR.*

H1b: *The amount of active ILI received has a positive direct effect on perceived usefulness of OLR.*

H1c: *The amount of passive ILI received has a positive direct effect on perceived usefulness of OLR.*

The model also assumes the relationship between ILI and perceived ease of use because there is evidence supporting this link. For example, Detlor et al. (2011) conducted interviews at three business schools and found that ILI resulted in a reduction in effort and time to find information:

H2a: *The amount of overall ILI received has a positive direct effect on perceived ease of use of OLR.*

H2b: *The amount of active ILI received has a positive direct effect on perceived ease of use of OLR.*

H2c: *The amount of passive ILI received has a positive direct effect on perceived ease of use of OLR.*

Previous research within the Information Systems and Library & Information Sciences disciplines has found that relevant training reduces computer anxiety (Igbaria, 1993) and library anxiety (Mark and Jacobson, 1995):

H3a: *The amount of overall ILI received has a negative direct effect on OLR anxiety.*

H3b: *The amount of active ILI received has a negative direct effect on OLR anxiety.*

H3c: *The amount of passive ILI received has a negative direct effect on OLR anxiety.*

Instruction also improves students' self-efficacy (Gist, 1987). For example, Ren (2000) found that electronic information search self-efficacy is significantly higher after receiving library instruction. Monoi et al. (2005) concluded that ILI has a positive effect on online research skills self-efficacy:

H4a: *The amount of overall ILI received has a positive direct effect on OLR self-efficacy.*

H4b: *The amount of active ILI received has a positive direct effect on OLR self-efficacy.*

H4c: *The amount of passive ILI received has a positive direct effect on OLR self-efficacy.*

Negative emotions are a deterrent to technology adoption. Anxiety forces technology users to divert attention away from the task at hand, creates self-deprecating thoughts, and discourages technology users from persisting in using a technology long enough to master its use. These diversions reduce users' perceived ease of use of an information system (Venkatesh, 2000) and digital libraries (Nov and Ye, 2008):

H5: *OLR anxiety has a negative direct effect on perceived ease of use of OLR.*

Social cognitive theory conceptualizes self-efficacy and anxiety as reciprocal determinants of each other (Bandura, 1986). In prior studies, the relationship between self-efficacy and anxiety has been modelled with self-efficacy as a determinant of anxiety (Compeau and Higgins, 1995) and also with anxiety as a determinant of self-efficacy (Thatcher and Perrewe, 2002). In this model, it is expected that students have higher levels of OLR anxiety early on. ILI, therefore, has an influence on OLR self-efficacy, and it is the increase in self-efficacy which brings about a reduction in anxiety:

H6: *OLR self-efficacy has a negative direct effect on OLR anxiety.*

The relationship between self-efficacy and the perceived ease of use of technology is well established in various contexts (Ong et al., 2004), including digital libraries (Nov and Ye, 2008, Thong et al., 2002). In the suggested model, self-efficacy partially mediates the influence of anxiety on perceived ease of use. Thus:

H7: *OLR self-efficacy has a positive direct effect on perceived ease of use of OLR.*

The relationships among the TAM constructs are well supported, including in the context of library websites (Ramayah and Aafaqi, 2004):

H8: *Perceived ease of use has a positive direct effect on perceived usefulness of OLR.*

H9: *Perceived ease of use has a positive direct effect on behavioral intentions to use OLR.*

H10: *Perceived usefulness has a positive direct effect on behavioral intentions to use OLR.*

METHODOLOGY

To measure the amount of **information literacy instruction received**, students were presented with a list of pre-identified classes that had an ILI component, and asked to name courses they had taken. A business librarian provided time spent on IL competencies in each class in each year. The information was decomposed into minutes of active ILI and passive ILI.

A new instrument was developed to measure **OLR anxiety** associated with seven IL skills from the SAILS test (Standardized Assessment of Information Literacy Skills, see https://www.projectsails.org). A question was designed to capture a respondent's level of anxiety with each of these specific skills. The instrument to measure **OLR self-efficacy** was developed

by following Bandura (2006). The respondents were presented with a set of tasks based on the categories of IL skills identified in the SAILS test and asked to assess their level of confidence in their ability to perform these tasks.

The scales measuring **perceived usefulness**, **perceived ease of use**, and **behavioral intentions** to use OLR were adapted from Davis (1989).

Two qualitative questions were designed for each of the OLR anxiety and OLR self-efficacy constructs to facilitate the interpretation of the quantitative results. The questions were kept broad in order to give respondents the greatest latitude in interpreting the questions and shaping their responses.

The instrument was face-validated and improved by using a team of twelve participants, comprised of Ph.D. students, librarians, faculty, ILI experts, and undergraduate students. They commented on the clarity of the questions employed, the comprehension level, completion time, and constructs domain. The questionnaire also included basic demographic variables. Online Appendix presents the instrument (http://foba.lakeheadu.ca/serenko/AMCIS2012.pdf).

The data for this study were collected using a web-based survey of 337 undergraduate business students of a North American university. This target population was ideally suited to the study of the adoption and use of OLR. The business school offers undergraduate, graduate and doctoral programs. It has a business library committed to improving ILI for business students. Business students have access to excellent OLR. The university libraries have 1.465 million print monograph titles, 369,000 electronic monographs, and 66,000 electronic serials. All undergraduate business students are exposed to ILI, held as independent sessions or part of business courses.

Respondent recruitment was guided by Dillman's (1999) tailored design method. An email invitation was sent to all 2,049 undergraduate students in the business school, followed by three follow-up reminders. An incentive consisted of one hundred randomly distributed $50 prizes.

RESULTS

A total of 337 usable responses were gathered at a response rate of 16.4% with the same number of female and male respondents. 25% were in year one; 24% in year two; 32% in year three; and 19% in year four. They majored in accounting (35%); finance (21%); marketing (19%); human resources (7%); general management (2%); information systems (1%); and operation research (1%). 14% still undecided on their major. Despite some minor differences, the obtained sample is a fair representation of the population of students at the business school.

Common method bias, which is a form of systematic error overstating the actual inter-construct correlation occurring when constructs are measured using the same method, was assessed and ruled out by means of Harman's one-factor test.

Tables 1 and 2 present item and construct descriptive statistics and reliability/validity assessment. They demonstrate an acceptable level of the psychometric properties of the measurement instrument. The matrix of cross-loadings reveals that all indicators loaded heavily on their own factors, except OLRSE7 (Table 3) that was dropped. The same pattern of loadings and cross-loadings was observed after OLRS7 was removed. Table 4 presents discriminant validity assessment. Since the square root of the average variance extracted (AVE) exceeded inter-item correlations, discriminant validity was assured.

Item	Mean	Std. Dev.	Loading	Error	Item-total correlations	t-value
OLRAX1	3.08	1.44	0.863	0.078	0.807	11.499
OLRAX2	3.09	1.41	0.879	0.076	0.810	14.384
OLRAX3	3.14	1.45	0.885	0.079	0.823	15.228
OLRAX4	3.13	1.49	0.899	0.081	0.849	14.024
OLRAX5	3.29	1.51	0.852	0.082	0.819	13.479
OLRAX6	3.48	1.56	0.750	0.086	0.738	6.550
OLRAX7	3.42	1.56	0.736	0.086	0.722	6.287
OLRSE1	5.55	1.07	0.854	0.059	0.801	20.618
OLRSE2	5.47	1.08	0.887	0.059	0.842	20.135
OLRSE3	5.57	1.08	0.863	0.058	0.794	20.094
OLRSE4	5.53	1.10	0.881	0.060	0.819	19.171
OLRSE5	5.32	1.14	0.845	0.062	0.807	19.115
OLRSE6	5.15	1.19	0.739	0.066	0.738	11.308
OLRSE7	5.00	1.24	0.622	0.069	0.673	6.042
PEOU1	4.37	1.51	0.708	0.082	0.610	7.436
PEOU2	5.16	1.13	0.864	0.061	0.745	20.997
PEOU3	5.12	1.28	0.910	0.070	0.789	23.187
PEOU4	4.94	1.37	0.900	0.075	0.788	24.554
PU1	5.19	1.19	0.846	0.065	0.747	26.010
PU2	5.20	1.21	0.909	0.066	0.829	28.643
PU3	5.33	1.12	0.921	0.061	0.850	34.577
PU4	5.50	1.22	0.854	0.066	0.725	21.391
BI1	5.73	1.19	0.975	0.065	0.874	48.046
BI2	5.75	1.18	0.971	0.064	0.874	66.063

Table 1. Descriptive Statistics and Reliability Assessment for the Measurement Items

Constructs	Mean	St. Dev.	Cronbach's Alpha	Composite Reliability	AVE
Overall Instruction (min)	58.52	22.08	n/a	n/a	n/a
OLRAX	3.23	1.26	0.93	0.94	0.71
OLRSE	5.37	0.95	0.92	0.93	0.67
PEOU	4.89	1.13	0.88	0.92	0.73
PU	5.30	1.05	0.91	0.93	0.78
BI	5.73	1.15	0.94	0.97	0.95

Table 2. Descriptive Statistics and Reliability/Validity Assessment for the Constructs

	AILI	OLRAX	OLRSE	PEOU	PU	BI
Overall Instruction	**1.000**	0.025	0.022	-0.026	-0.071	-0.081
OLRAX1	0.059	**0.863**	-0.312	-0.342	-0.198	-0.299
OLRAX2	0.044	**0.879**	-0.349	-0.387	-0.224	-0.316
OLRAX3	0.060	**0.885**	-0.386	-0.406	-0.202	-0.276
OLRAX4	0.074	**0.899**	-0.316	-0.396	-0.199	-0.246
OLRAX5	-0.001	**0.852**	-0.347	-0.315	-0.181	-0.252
OLRAX6	-0.107	**0.749**	-0.243	-0.270	-0.132	-0.180
OLRAX7	-0.039	**0.735**	-0.262	-0.243	-0.139	-0.203
OLRSE1	-0.005	-0.381	**0.855**	0.564	0.452	0.434
OLRSE2	-0.003	-0.333	**0.888**	0.555	0.409	0.359
OLRSE3	0.002	-0.350	**0.863**	0.517	0.403	0.436
OLRSE4	-0.001	-0.370	**0.881**	0.575	0.407	0.458
OLRSE5	0.112	-0.310	**0.845**	0.531	0.377	0.330
OLRSE6	-0.009	-0.231	**0.739**	0.457	0.389	0.292
OLRSE7*	0.043	-0.142	**0.622**	0.351	0.302	0.234
PEOU1	0.057	-0.218	0.359	**0.707**	0.227	0.080
PEOU2	-0.050	-0.415	0.616	**0.884**	0.525	0.425
PEOU3	-0.018	-0.382	0.557	**0.910**	0.475	0.378
PEOU4	-0.036	-0.333	0.554	**0.900**	0.498	0.330
PU1	0.020	-0.125	0.398	0.433	**0.846**	0.515
PU2	-0.109	-0.207	0.432	0.540	**0.907**	0.572
PU3	-0.064	-0.209	0.452	0.481	**0.922**	0.630
PU4	-0.049	-0.227	0.412	0.419	**0.855**	0.718
BI1	-0.078	-0.291	0.452	0.390	0.700	**0.975**
BI2	-0.080	-0.301	0.429	0.364	0.649	**0.971**

Table 3. Matrix of Loadings and Cross Loadings (* - dropped item)

	OLRAX	OLRSE	PEOU	PU	BI
OLRAX	**0.840**				
OLRSE	-0.388	**0.818**			
PEOU	-0.415	0.630	**0.854**		
PU	-0.254	0.417	0.537	**0.883**	
BI	-0.302	0.401	0.422	0.727	**0.973**

Note: the diagonal elements are the square roots of AVE. The off-diagonal elements represent correlations between constructs

Table 4. Discriminant Validity Assessment

SmartPLS version 2.0.M3 was used to assess the structural model (Chin, 1998). The significance of the path coefficients (i.e., t-values) was assessed using the bootstrapping technique with 700 samples. Figure 2 presents the structural model, and Table 5 outlines the results of hypotheses testing.

OLR anxiety partially mediates the effect of OLR self-efficacy on perceived ease of use. This mediation effect was tested and confirmed using: 1) Baron and Kenny's (1986) method; 2) the Sobel (1982) test; and 3) PLS (Bontis et al., 2007). Baron and Kenny's method revealed that the relationship between OLR self-efficacy and perceived ease of use of OLR dropped from 0.687 to 0.602 after the mediator variable was included. The result of the Sobel test was similar (p-value=0.000). In PLS, the R^2 of the mediated model was higher than that of the simple model (simple model R^2=0.388 vs. mediated model R^2=0.422).

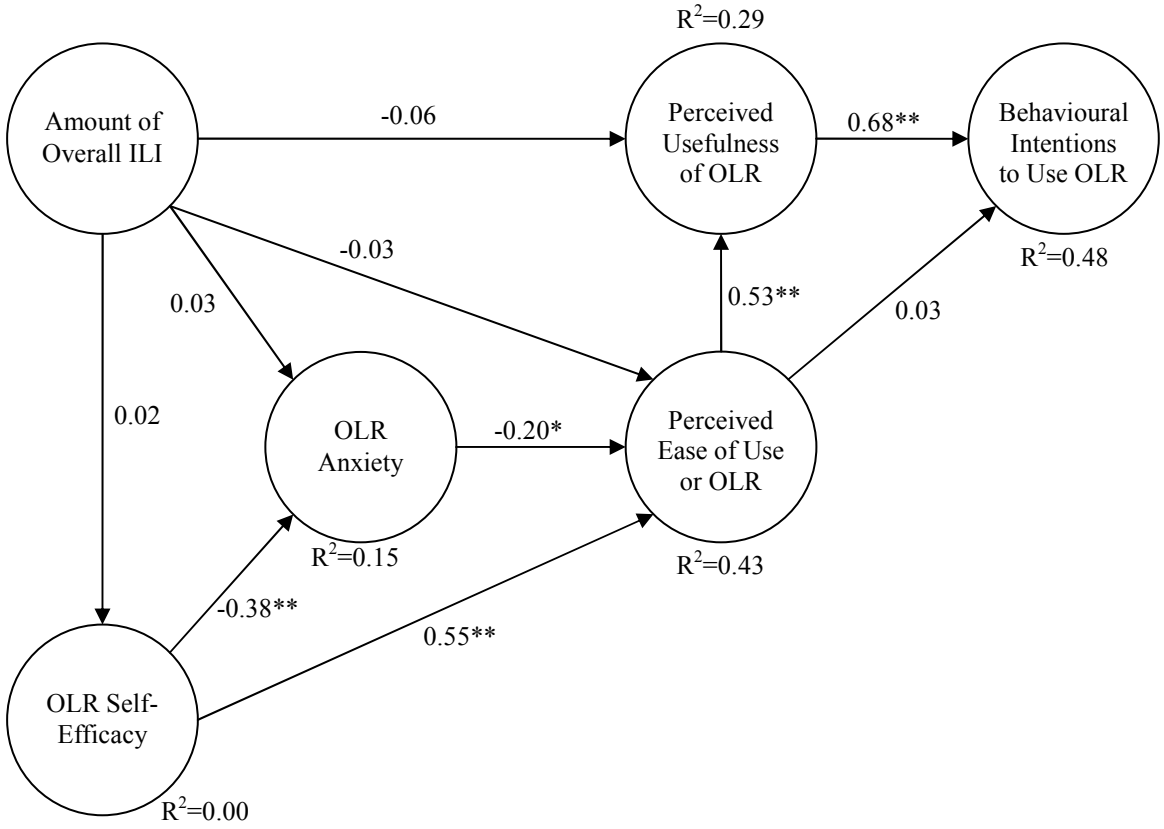

Figure 2. The Structural Model (*– p < 0.005; ** – p <0.001)

The coding method was based on the procedures of Strauss and Corbin (1990). Objects and items were labeled according to their characteristics. Conceptual ordering was performed by categorizing data into mutually exclusive and exhaustive categories across multiple dimensions. A classification scheme was developed and refined as coding progressed. Categories were summarized and cross-tabulated.

Table 6 and 7 present the results of frequency counts and cross-tabulations for the effect of ILI on OLR anxiety and self-efficacy, respectively.

Anxiety is commonly experienced by business students. Although only 41% of respondents commented that they currently experienced anxiety, a majority of the remaining 59% reported that their anxiety had been reduced as a result of ILI. This indicates that they had previously experienced anxiety. A large majority of business students experience OLR anxiety during their school career.

Analysis strongly indicates that ILI effectively diminishes OLR anxiety. Only 29% of the comments showed that ILI had no effect on anxiety. The majority indicated that ILI reduced their level of OLR anxiety, for example:

> *"After receiving instructions by the librarians, I became more capable at accessing these resources which decreased my anxiety over the assignments that needed to be completed for my courses."*

A link between ILI and increased self-efficacy was established, for instance:

> *"After being taught of shortcuts and tips by the librarians, I am confident in my ability to use the online resources."*

The qualitative responses strongly support the influence of ILI on OLR self-efficacy and OLR anxiety, and call into question the results of the quantitative model. A detailed examination revealed that many students mentioned not only ILI, but also their actual hands-on experience with OLR as a source for reduced anxiety and improved self-efficacy. For example:

> *"I am very comfortable and confident because I watched the librarian show us how to use certain resources and after using them over and over, I feel I can use them with no difficulty."*
>
> *"I learned general knowledge from the instruction sessions and have since then figured my own way around the resources."*

A common theme was that the formal information literacy training (i.e., either active or passive) provided students with the initial knowledge and skills necessary to start using OLR. However, reduced anxiety and increased self-efficacy only occurred some time later after students had a chance to independently use online library resources when working on assignments, projects, reports, etc. that required the use of credible information sources:

> *"During my first year these sessions increased my level of comfort when using these resources, but throughout my time at [university name] the sessions have become very repetitive thus there has been no real effect with my level of comfort and confidence."*

Hypothesis	Path	Beta	t-value	p-value	Result
H1a	Amount of Overall ILI → PU	-0.06	1.262	n.s.	rejected
H2a	Amount of Overall ILI → PEOU	-0.03	0.456	n.s.	rejected
H3a	Amount of Overall ILI → OLRAX	0.03	0.424	n.s.	rejected
H4a	Amount of Overall ILI → OLRSE	0.02	0.390	n.s.	rejected
H1b	Amount of Active ILI → PU	-0.08	1.232	n.s.	rejected
H2b	Amount of Active ILI → PEOU	-0.01	0.823	n.s.	rejected
H3b	Amount of Active ILI → OLRAX	0.03	0.647	n.s.	rejected
H4b	Amount of Active ILI → OLRSE	0.06	0.407	n.s.	rejected
H1c	Amount of Passive ILI → PU	-0.02	0.325	n.s.	rejected
H2c	Amount of Passive ILI → PEOU	-0.03	0.726	n.s.	rejected
H3c	Amount of Passive ILI → OLRAX	0.02	0.478	n.s.	rejected
H4c	Amount of Passive ILI → OLRSE	-0.02	0.295	n.s.	rejected
H5	OLRAX → PEOU	-0.20	2.938	<0.005	supported
H6	OLRSE → OLRAX	-0.38	5.782	<0.001	supported
H7	OLRSE → PEOU	0.55	14.304	<0.001	supported
H8	PEOU → PU	0.53	10.699	<0.001	supported
H9	PEOU → BI	0.03	0.501	n.s.	rejected
H10	PU → BI	0.68	13.424	<0.001	supported

Table 5. Hypotheses Testing

	Effect of ILI on Anxiety						
Level of OLR Anxiety	No effect	Somewhat reduced anxiety	Reduced anxiety	Much reduced anxiety	Increased Anxiety	Unclear effect	Total (count / %)
No anxiety	35	4	59	3	1	26	128 59%
Some anxiety	9	5	32	0	0	21	67 31%
Anxiety	5	2	10	1	1	2	21 9.5%
Strong anxiety	0	0	1	0	0	0	1 0.5%
Total (count / %)	49 29%	11 7%	102 61%	4 2%	2 1%	49	217 100%

Table 6. Cross-Tabulation - Effects of ILI on OLR Anxiety

	Effect of ILI on Self-Efficacy					
Level of OLR self-efficacy	No effect	Somewhat increased self-efficacy	Increased self-efficacy	Greatly increased self-efficacy	Unclear effect	Total (count / %)
Not confident	4	0	6	0	11	21 11.0%
Somewhat confident	0	1	0	0	1	2 1.0%
Not fully confident	1	0	14	0	9	24 12.6%
Confident	14	3	77	1	36	131 68.6%
Very confident	2	0	7	0	4	13 6.8%
Total (count / %)	21 (16.2%)	4 (3.0%)	104 (80.0%)	1 (0.8%)	61	191 100%

Table 7. Cross-Tabulation - Effects of ILI on OLR Self-Efficacy

DISCUSSION AND CONCLUSION

First, it was hypothesized that students would perceive OLR to be more useful (H1) and easier to use (H2) after receiving ILI. The findings did not support either expectation when ILI was measured in terms of the amount of overall, active and passive instruction received. It was assumed that business students would experience less anxiety (H3) and higher self-efficacy (H4) when using OLR after they had received relevant training. Again, both hypotheses were rejected for all three categories of instruction.

On the one hand, these findings do not align with previous research. On the other hand, the perplexing dissonance between the findings of this study and the results of previous projects is resolved when one considers the responses to the open-ended questions. Almost 70% of the business students indicated that ILI reduced their level of OLR anxiety, and 84% felt that ILI increased their level of OLR self-efficacy. These results indicate that the hypothesized relationships between ILI and OLR anxiety, and between ILI and OLR self-efficacy do exist. More importantly, however, many students mentioned that their anxiety and self-efficacy with online library resources only continued to improve after these students had the opportunity to

apply their newly taught IL skills in practical settings, for example, when they worked on projects, papers and assignments that required an extensive use of OLR. These findings suggest that ILI does help students get started, but at some early stage a saturation point is reached where more instruction contributes little, if anything, to the final outcome, such as reduced OLR anxiety and increased OLR self-efficacy. Rather, it is the independent, continuous use of OLR after receiving initial, formal information literacy instruction that creates continued positive effects (Figure 3).

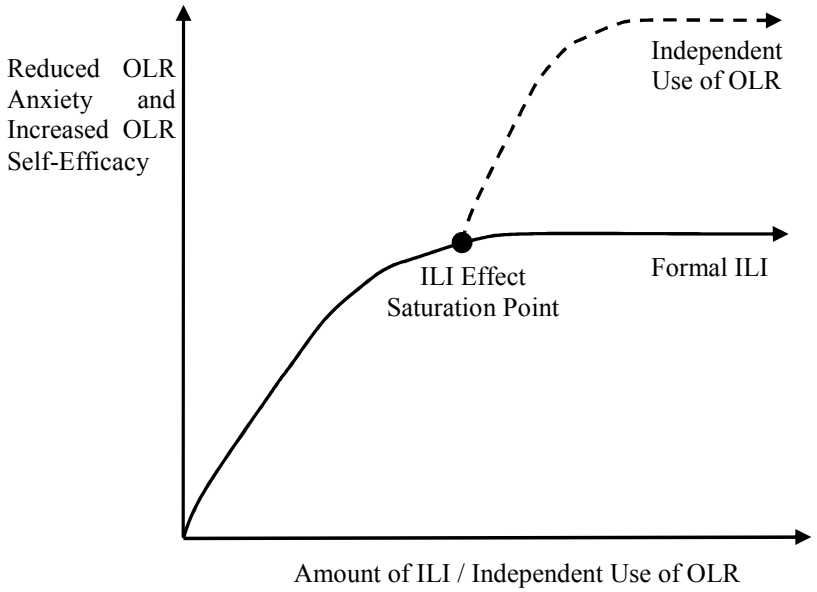

Figure 3. The Effect of ILI and Use of OLR on Anxiety and Self-Efficacy

This finding has practical implications. Information literacy instructors should know that continually increasing the amount of ILI received is not an effective way of improving students' OLR self-efficacy or reducing their anxiety. This study, however, does not deny the importance of initial IL sessions delivered to students. These initial sessions are a valuable and needed step towards developing positive student learning outcomes. However, their effect quickly reaches a saturation point after which the value of receiving more sessions deteriorates. At this point, students would be better served if they were given opportunities to practice using online library resources on their own. Instructors and librarians should assure that after students receive an initial set of ILI sessions, students are provided with consistent, incremental and independent opportunities to use OLR throughout their entire educational careers.

Second, OLR self-efficacy and anxiety are antecedents to OLR adoption. This study extends previous research on computer self-efficacy, computer anxiety and library anxiety by employing measures of self-efficacy and anxiety that are specific to OLR. The results reveal that the relationship between OLR anxiety and the perceived ease of use of OLR was negative (β = -0.20, p-value < 0.005). Third, the relationship between OLR self-efficacy and OLR anxiety is negative and significant (β = -0.38, p-value <0.001), which is consistent with Bandura's social cognitive theory. OLR self-efficacy influences anxiety because over time training and experience would increase students' self-efficacy, which would reduce their level of anxiety. OLR anxiety partially mediates the relationship between self-efficacy and perceived ease of use.

IL instructors should be aware that OLR anxiety and OLR self-efficacy are real phenomena. Students should realize that it is normal to experience anxiety and low self-efficacy when they first come across OLR, but these can be improved through initial ILI sessions and opportunities to use OLR on a continued basis. IL instructors should make a conscious effort to increase OLR self-efficacy and reduce OLR anxiety by designing training interventions that specifically address OLR self-efficacy and OLR anxiety.

This paper reports results from an exploratory study investigating the effects of information literacy instruction on the adoption and use of online library resources by business students. ILI was measured in terms of the amount of overall, active,

and passive ILI received, and examined in terms of its effect on perceived usefulness and perceived ease of use of online library resources. The effects of the information literacy instruction received on students' self-efficacy and anxiety with online library resources, and how these in turn impacted student perceptions of the usefulness and ease of use were also assessed.

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