

ONLINE LEARNING COMMUNITIES: ENHANCING UNDERGRADUATE STUDENTS' ACQUISITION OF INFORMATION SKILLS

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Introduction

Since the Association of College and Research Libraries (ACRL, 2000) approved the Information Literacy Competency Standards for Higher Education, many efforts have been made to help undergraduate students develop the information skills they need. Although there are different activities that have been developed to facilitate the acquisition of information skills and work with the students' limitations and the problems that are evidenced, and research has identified librarians as the key resource to educate students and to help them develop better research skills (Mundava, & Chaudhuri, 2007; Wilbe, 2006), the reality is that librarians do not have enough time available to spend with students and to support them. Students do not value the presence of the librarians in the classroom and do not consider that the provided information is part of the content they are learning (Brendle-Moczuk, 2006). The librarians are usually at a disadvantage when trying to assess the students' learning after only one session, for three main reasons: the limited contact with students, the absence of faculty support, and the librarian's different responsibilities (Choinski & Emanuel, 2005).

To address the students' needs within the time limitations and other possible obstacles, librarians have been developing online tutorials to facilitate the acquisition of specific information skills. One example of this type of resource is the Texas Information Literacy Tutorial (TILT), which was designed by the Digital Information Literacy Office of the University of Texas System Library (Roberts, 2003), and can be accessed by students and other individuals through the Internet.

Although it seems that online tutorials provide a once-and-for-all solution, there are limitations if the online tutorial is the only resource that is made available to students. They will miss the opportunity to interact, share, and communicate their different ideas, questions, and solutions through the whole learning process. These limitations could make a significant difference between a student who receives face-to-face instruction and a student who only uses an online tutorial.

As discussed by Karplus (2006), ACRL recommends that online tutorials and other types of online teaching resources should support diverse teaching approaches, incorporate appropriate information technologies and other media resources, and include active and collaborative activities. Considering this, online learning communities provide the opportunity to offer effective teaching approaches, because every member has the opportunity to share knowledge

and communicate specific needs. Also, through an online learning community, it is possible to incorporate diverse information resources, such as documents, links to specific web sites, videos, and images. In terms of the opportunity to enhance the development of information skills, online learning communities offer the opportunity to develop and use active and collaborative activities, such as discussion forums, chats, email, and other types of online communication tools, which will offer different types of resources to different types of learners.

Review of the Literature

Online Learning Communities

In general, “an online learning community is a group of people who meet online and communicate via communication networks, sharing common interests and goals, engaging in knowledge-related transactions, and supporting each other in their learning agendas” (Ma, 2006, p. 11). Davies, Ramsay, Lindfield, and Couperthwaite (2005) discuss the results of a learning community that was built with students of a BS Physiotherapy degree program at the University of Birmingham. The researchers found that students had the opportunity to improve their communication skills, enjoyed the interaction with different people and sharing their ideas and, after their participation, were able to develop their knowledge. They also identified the need to encourage students to participate in the online discussions because of the poor participation of some students. This last aspect is something that needs special attention during the design of an online learning community, which means that it is necessary to build effective strategies to promote students’ participation. One important strategy that could be used when designing an online learning community is to provide activities to help develop a sense of community among the participants.

Ma (2006) conducted a study in which he examined 12 students and one instructor in an online Master’s degree program at a major distance education institution. The author found that there was no real sense of an online learning community among the participants and that the interaction was centered around the professor and not among the students. As part of the conclusions, the author acknowledged the need to intentionally design and implement an online learning community as part of an online course and degree program. It was necessary to consider the importance of identifying, designing, and implementing effective teaching and learning strategies for the development of an online learning community.

Online Learning Communities in Library Environments

Graham, Faix, and Hartman (2009) present the experience of Kimbel Library. As explained by the authors, the library staff created a group through Facebook, whose main objective was to update students about new library resources, services, and events. Librarians also shared photographs of the different library areas and different activities held at the library. As a result, many students joined the group and shared their comments through the discussion forum and through email. As the authors discussed in the article, the experience of using Facebook was a new adventure for the librarians, but with very positive results. On one side, the librarians that were new to this technology had the opportunity to learn new ways of communication, while on the other side, students had the opportunity to share comments and ask questions through a tool they enjoyed and with which they were familiar.

Another experience with Facebook of the librarians at Rutgers University Libraries is presented in an article published by Glazer (2009). Their intention of creating a group through Facebook was to publish the library news, what is happening at the library, and information about new resources and services. They found that Facebook activities led to useful information about

students' preferences, positive press coverage, terrific testimonials, and rewarding extensions of established relationships.

Online Learning Communities and Information Literacy Programs

The literature that was discussed in the previous section evidences the benefits of the collaboration between librarians and faculty members, the benefits of an effective interaction between librarians and students, the popularity of Facebook as a social network, and the possibilities it provides to create new ways of communication with users. In general, it was also evidenced that "The majority of articles about Facebook found in library publications are concerned with explaining to the uninitiated exactly what Facebook is and with exploring various ways that Facebook might be used by librarians to promote library services" (Graham, Faix, & Hartman, 2009, p. 228). The importance of beginning this type of experience relies on the fact that Facebook is part of the Web 2.0 technologies that students are constantly exploring and using, and that many librarians are also starting to explore (Mitchell & Watstein, 2007).

However, of all the literature that was reviewed, only one article mentions the opportunity that Web 2.0 technologies (such as Facebook) provide the support to students while they are developing information skills. In this case, Mitchell and Watstein (2007) indicated that information literacy services such as "links to basic information literacy information (how to use, online tutorials, pathfinders, library staff responsible for information literacy instruction" (p. 523) may be used through Facebook. Also, the authors mentioned the possibility of providing links to learning objects for a course or providing access to a list of learning objects. Although this is mentioned as a possibility, there is still no evidence that there are librarians that are currently using Facebook to develop an online learning community to support students while they are developing specific information skills. There is a great deal of work that can be done related to this topic and how it can be developed as an effective tool for information literacy programs.

Purpose of the Study

Online learning communities could be considered as an alternative to face-to-face instruction and online tutorials, and an additional tool to enhance the acquisition of information skills by students. Furthermore, online learning communities will offer students the support they need in completing their course work when librarians do not have the time, space, and availability to meet their needs.

The purpose of this study was to investigate the effectiveness of the design and implementation of online learning communities on supporting students while they develop specific information skills. The following research questions facilitated the investigation and guided the study:

1. What are the information skills already possessed by undergraduate students?
2. How does the effectiveness of an online learning community compare to the effectiveness of library online tutorials regarding the students' acquisition and development of information skills?
3. How does the use of an online learning community compare with the use of online tutorials in terms of the communication and interaction between the librarian and students?
4. What is the level of satisfaction experienced by students who completed the library online tutorials when compared to the students who participated in the online learning community?

5. What are the steps that should be followed and the aspects that are important to consider for the effective development of online learning communities and online tutorials in order to enhance the students' acquisition of information skills?

Methodology

Context of the Study

University of Puerto Rico in Carolina (UPRC) is one of the 11 campuses of University of Puerto Rico (UPR) and consists of approximately 4,000 students, 250 faculty members, and 230 administrative personnel. The Learning Resources Center (LRC) of UPRC began operations in 1974 as the first academic department of the campus. Today, the LRC staff consists of 28 employees, including eight professional librarians, all with ALA accredited masters degrees. The LRC includes the following public service areas: Reference, Circulation and Reserve, Periodicals Collection, Puerto Rican Collection, and the Information Literacy and Technology Program (ILTP). ILTP offers a great number of teaching activities to faculty and students. Orientations, conferences, and workshops are offered to develop the users' information skills. These activities are developed abiding by the information literacy standards published by the Association of College and Research Libraries (2000).

As part of an evaluation process conducted at the library in 2007, the Library Evaluation Committee of the UPRC stated that "Many faculty members are unwilling to integrate information literacy activities into their courses" (p. 12). This finding evidences the limitation that the library staff experiences in the development of the students' information skills, and the need to effectively integrate the teaching of information skills into the courses. As a result of this evaluation, the following recommendations were presented: install a computer laboratory at the LRC at UPRC, integrate all library staff to collaborate with the ILTP, promote the integration of information literacy activities among all faculty members, and include these activities as part of all General Education courses. The ILTP is currently working on the integration of the information skills in the General Education courses, which will increase the information literacy activities.

Research Design

This study used a mixed method. The qualitative inquiry was a case study that provided the opportunity to conduct an in-depth exploration (Creswell, 2005) of the development of an online learning community and online tutorials, as well as the experiences of the users in a real-life context, using multiple data sources, such as focus groups, discussion postings, and emails.

The quantitative inquiry adopted a factorial design to examine the effectiveness of the online learning community and online tutorials. The two independent variables investigated in this study are the two instructional delivery methods: online tutorial and online learning communities. The dependent variable was the acquisition of information skills. The independent and interactional effects of the two independent variables on the dependent variable were examined, as shown in

Table 1 below:

Table 1: Independent Variables in the Factorial Design

Factor 1: Online Tutorial (OT)		
Factor 2: Online Learning Communities (OLC)	NOT-NOLC	OT-NOLC
	NOT-OLC	OT-OLC

Data Collection Procedures

The participants in this study were 95 undergraduate students registered in four sections of a second year English course. On average, these students ranged in age from 18 to 20. The four sections of the English course were randomly assigned to one of the four study conditions:

- NOT-NOLC: The section received the traditional one-time library session of face-to-face instruction for the acquisition of information skills.
- NOT-OLC: The section received the traditional one-time face-to-face instruction and was required to participate in an online learning community for 12 weeks to enhance their acquisition of information skills.
- OT-NOLC: The section received the traditional one-time face-to-face instruction and was required to complete four library online tutorials to enhance their acquisition of information skills.
- OT-OLC: The section received the traditional one-time face-to-face instruction and was required to complete four library online tutorials and participate in an online learning community for 12 weeks to enhance their acquisition of information skills.

Online tutorials and online learning communities were developed and used to facilitate students' acquisition of information skills. The researcher designed four online tutorials. Each online tutorial included a pre-test, a post-test, the course objectives, the course work, and the library instructions. Specific exercises about the content of the tutorials were included to reinforce the material that was explained. Specific information skills were practiced through each online tutorial, offering all the needed skills for the development of the course work. Participants were able to access the online tutorials at any moment, from anywhere.

The online learning community was developed using Facebook, which is a social utility and often used by students. Through this technology, one activity was offered each week for a total of 12 activities during the study. These activities included: questions to be answered about posted videos, PowerPoint presentations and questions related to the topics discussed through the presentations, link to Web sites previously evaluated, and discussion boards. All these activities were developed to teach specific information skills that are necessary to meet the course objectives and complete the course work.

An information literacy pre-test was administered that helped to identify the information skills already possessed by students before the study and their information needs. This pre-test was developed based on the course objectives and the information skills that were to be developed through the course.

Throughout the study, the researcher recorded the students' participation in the online learning community and collected the students' logs to complete the online tutorials. The students' acquisition of information skills across the four study conditions was measured by the results in the post-test.

At the end of the 12-week course period, the researcher asked a group of 15 students (three groups of five from each of the OT-NOLC, NOT-OLC, and OT-OLC conditions) to participate in a focus group to assess their satisfaction level with their participation in the online learning community and with the library online tutorials. The focus group discussions were recorded and then transcribed for data analysis. Using the transcripts, the researcher compared the students'

answers to the questions with their messages posted during their participation in the online learning community (discussion forums and emails). Through this comparison it was possible to identify if there were any discrepancies between what they expressed in the focus groups and the online learning community. Also, one week after the focus groups, the researcher visited the classroom and individually asked each participant if what they said actually matched their experience in the online learning community. This individual conversation allowed students to express what they really felt without any group pressure.

All study instruments (pre-test, post-test, and focus groups) were validated using a pilot group of 5 students who were not registered in the English courses. Their comments and observations were collected and utilized to modify the instruments for enhanced validity.

Results and Discussion

Pre-test

One-way analysis of variance (ANOVA) was used to determine whether there were significant differences among the pre-test scores of all groups. As presented in Table 2, there was no proof that there was significant statistical difference in the pre-existing information skills of the students across the four groups.

Table 2. ANOVA for Pre-test Results

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	57.855	3	19.285	1.088	.358
Within Groups	1790.202	101	17.725		
Total	1848.057	104			

Post-test

Table 3 presents the mean scores and standard deviations in the post-test for the four groups. As it is shown, OT-NOLC had the lowest mean value, while the NOT-OLC group had the highest mean value. In terms of the standard deviation, it is interesting to see that the NOT-OLC evidenced the lowest standard deviation, while the OT-NOLC group had the highest one.

Table 3. Means and Standard Deviations of the Post-test Results

	N	Mean	Std. Deviation	Minimum	Maximum
NOT-NOLC	16	19.25	4.480	11	26
NOT-OLC	25	25.32	2.174	22	29
OT-NOLC	22	18.64	4.716	5	23
OT-OLC	32	22.9	3.306	17	28
Total	95	21.86	4.471	5	29

After identifying and comparing the mean and standard deviation value it was necessary to conduct an ANOVA to determine if there is a statistical significant difference among groups. The results of the ANOVA showed that there was significant difference among the groups in their post-test scores.

Table 4. ANOVA for Post-test Results

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	658.815	3	219.605	16.375	.000

Within Groups	1220.406	91	13.411
Total	1879.221	94	

Since there was evidence of a statistical significant difference among the post-test scores, to find out, pair-wise, which group significantly differed from which group among the four, a post-hoc multiple comparison test (Tukey) was performed. To be able to perform this analysis, a table of two columns was prepared. On the first column a value was assigned for each group; 1 for the control group (NOT-NOLC), 2 for NOT-OLC group, 3 for OT-NOLC group, and 4 for OT-OLC group. Table 5 presents the output of this analysis.

Table 5. Tukey Output for the Post-test Scores

	Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.
Tukey	1	3	.614	1.203	.957
	2	1	6.070*	1.172	.000
		3	6.684*	1.071	.000
		4	2.633*	.978	.041
	4	1	3.438*	1.121	.015
		3	4.051*	1.014	.001

The results showed that NOT-OLC was the group that significantly differed from the other three groups, meaning that this group was the one that obtained better scores on the post-test, thus demonstrating that the online learning community was more effective. When comparing OT-OLC with the other groups, the scores of OT-OLC significantly differed from the scores obtained by NOT-NOLC and OT-NOLC. When analyzing these results, it can be assumed that the OT-OLC group obtained better scores when compared with OT group because of their participation through the online learning community. In general, it can be concluded that the online learning community was more effective on students' information skill acquisition compared to the online tutorials.

Focus Groups

At the end of the 12-week course, the researcher guided three focus groups to ask the participants to share their perceptions of the experience in the study.

When the students that completed the online tutorials were asked to describe their experience, the first descriptor that was used by four out of the five students was educational, since they were able to learn a lot from the information that was provided. Three students indicated that they learned much about how to use the APA manual; two students indicated that they learned much about how to search for information through the Internet, and one student indicated that he learned much about searching for information through the library online databases. Other descriptors included: interesting, helpful, and good.

On the other hand, when the researcher asked this question to the students in OT-OLC, the first descriptor that was used was good, since they were able to learn new things. The descriptors used by the participants in the NOT-OLC group were: enriching, good, innovative, beneficial, and excellent. One student that considered this an enriching experience explained that "the use of Facebook is a useful alternative since almost all the students use Facebook almost all day." The student that considered that it was a good experience explained that "I know how to use Facebook, but I never used it for a course before. This experience was something new for me." A similar response was offered by the student who described this experience as excellent; this

student indicated that “It would never occur to me to use Facebook for an educational purpose; this experience opened my mind about other uses Facebook offers.” Another student added that “the interaction with the librarian was beneficial, and this is something that the online tutorials do not offer.”

The students were also asked to select one of the following, very satisfied, satisfied, or unsatisfied, to identify their satisfaction level with the experience. The results from the OT-NOLC group were: three students answered that they were satisfied, and two students answered that they were very satisfied. On the other hand, four students from OT-OLC answered that they felt very satisfied, while one student answered to be satisfied related to the use of the tutorials. Some of the students who answered that they were very satisfied explained that they recognized that they were able to learn how to complete their course work, especially their bibliographies. Also, these students appreciated the initiative of using the computer as part of the course. All the participants from NOT-OLC agreed that they were very satisfied with their participation through the online learning community. They expressed that that this was an interesting strategy that allowed them to develop their works. All the participants from both groups answered that they would recommend the use of Facebook. Some of the reasons participants gave were: “it was a useful experience for all the students”; “we felt confident in sharing questions”; “it provided us, as students, the information we need at any time, and the opportunity to have direct communication with the librarian”; “Facebook offers students another way to clarify questions,” “Facebook demonstrated to be a complete teaching strategy,” and because “it was useful.”

When the students were asked if they recommended the use of online tutorials as part of their courses, from the OT-NOLC group, four students agreed to recommend, and some of their reasons were: “these tools offer something dynamic to the course”; “because not all the students possess the skills that are necessary to search for and use information”; “I was able to learn how to prepare my course work”. On the other hand, only one student said that he would not recommend the use of the tutorials, since he got bored reading the information.

In terms of the answers from the OT-OLC and NOT-OLC groups, all the students would recommend the use of these tutorials, and some of their reasons were: “because they provided information that we needed to prepare our course work,” “because I learned about things I did not know,” and “because now I can use more the computers and the library Web page.” These answers showed the importance of identifying the specific information needs of the students before developing online tutorials. Also, it is necessary to design those tutorials using different strategies like video, sound files, images, and text, since it is necessary to meet different learning styles.

In general, these responses indicate that the students considered this experience as beneficial and enriching, since they were able to use Facebook to learn things they needed for their course work. They also agreed that this was something new, and they appreciated this integration.

Conclusions

After comparing and analyzing the results from the post-test, it can be concluded that the online learning community was more effective in enhancing the acquisition of information skills by undergraduate students. The ANOVA that was performed with the post-test scores revealed that there was a significant statistical difference between the groups. Furthermore, the results of the Tukey analysis revealed that the scores from the NOT-OLC group significantly differed from the other groups, proving it to be a more effective treatment. On the other hand, OT-NOLC group did not perform in a better way than the other groups.

In terms of the results from the control group, it can be concluded that one shot sessions of face-to-face library instruction do not provide the support students need to acquire and develop the information skills that are needed to complete different workshops. The time limitation of this type of activity only provides the opportunity to offer basic information about the library services and information resources, which is not enough to meet the students' information needs.

After analyzing the results of the guided focus groups of the students who completed the online tutorials and participated in the online learning community, it can be concluded that the students who participated through the online learning community unanimously agreed that they were very satisfied with the experience, while a great percentage of the participants who completed the online tutorials answered that they were satisfied. Specifically, their responses demonstrated that the online learning community was more effective when providing them with the information and support they needed during their course, although it can be understood that the difference in this satisfaction level was not significant. This same situation was shown in the differences between the students description of their experience, demonstrating that both treatments were effective.

The most important implication of this study is the development and implementation of online learning communities as a tool to enhance the information skills by undergraduate students. The decision to implement this type of experience requires librarians and professors to work together and make decisions regarding the specific objectives and activities that will be offered to students. During the planning process it is necessary to consider different aspects, such as: course objectives, course assignments and activities, and the specific information skills that are necessary to develop. After these decisions are made, librarians need to design teaching products that will be used during the process, and determine what information will be shared. To be able to develop an effective online learning community, it is also important to schedule the activities that will be offered during the semester, since it is important to promote an effective interaction and communication with students. It is this interaction the one that will provide the support students need to enhance their information skills.

It is recommended that further research in this area be done. The fact that Web 3.0 technologies could be used to enhance the information skills of students is still a topic that should be examined. It is important to consider that the study revealed the students' high level of satisfaction with the online learning community because of this; further study should address attitudes toward the use of other technologies for the same purpose.

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