

**Asynchronous Learning Networks in Higher Education:
A Review of the Literature on
Community, Collaboration & Learning**

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Every aspect of modern life is affected by technology, and education is no exception. As rapidly evolving modes of information and avenues of communication continue to pervade our society, it has become evident that technology has changed the face of learning in the 21st century. Technology, specifically computers and the internet, clearly has a place in academic institutions as a means to enhance learning and deliver instruction, and has consequently emerged as an important way to support and enrich education. An example of this phenomenon is distance education, which has become a significant delivery method in higher education. As indicated by the number of online courses and degree programs that are offered at colleges and universities, distance learning is being widely embraced as a tool to provide increased flexibility and effectiveness for students. It provides greater access to educational opportunities and offers new ways of teaching and learning, resulting in the ability to reach a greater number of learners and to meet the needs of non-traditional students.

Higher education continues to experience a significant shift towards technology use in course delivery, and asynchronous learning has become a rapidly growing approach to online learning. This widely used model of distance learning, commonly known as the asynchronous learning network (ALN), can be described as distance learning that uses the internet to deliver instruction any place and at any time. It involves the ability to communicate and learn independent of time and location as students are able to access course materials and interact with each another at any time of their choosing (for

example, through the use of discussion forums, electronic bulletin boards, and/or email). This asynchronous aspect is what makes online education appealing for many students and educators; it removes the restrictions of time and location for both the student and the teacher, and it allows flexibility in the time, place and pace of communication for people who are unable to attend on-campus classes.

Purpose and Methodology of Literature Review

Asynchronous learning has received considerable attention for its convenience, but there still are issues regarding its ability to promote substantial learning and collaboration between students. As a growing number of colleges and universities offer online courses, they face important questions regarding whether a sense of learning community is created that promotes interaction and dialogue as well as in the traditional classroom. The purpose of this literature review is to examine these aspects of collaboration and sense of community, and examine the overall attitude of college students toward learning via distance education in order to see if ALNs enhance the educational experience in a significant way. By doing so, factors that motivate and deter participation in web-based asynchronous education can be identified. This knowledge can be of great value, assisting educators in developing distance education courses that are beneficial to students as effective and powerful methods of learning.

The research studies chosen for this literature review focused on learning communities and collaborative learning in asynchronous online courses, as well as attitudes of students learning via ALNs and the perceptions that they have regarding this learning process, their satisfaction with online delivery of courses, and their learning outcomes. Included are qualitative and quantitative research studies that evaluated programs and/or courses in which the content and communication were delivered primarily online and were limited to undergraduate or graduate level education. An attempt was made to review research that was relatively current, and selected research literature includes articles from periodicals and conference presentations retrieved from academic journals discovered through library databases (ERIC, Education Full Text). For the purpose of this literature review, online learning and distance education will refer only to the asynchronous, web-based format.

Review of the Literature

For this review of literature, a number of studies related to sense of community, collaborative learning, and student satisfaction in asynchronous instruction were reviewed. It quickly became apparent in the review process that asynchronous online learning does allow students to have great flexibility, but it must also promote a collaborative learning environment where the students learn with and from one another. To meet the challenge of preparing students to be life-long learners, there has been movement towards such student-centered, collaborative learning environments. Collaborative learning

environments emphasize the creation of knowledge by having students actively work together on assignments. Knowledge consequently emerges from this student interaction as their contributions of different understandings and viewpoints enhance the group's learning, and suggestions and feedback to one another provide encouragement, social support, and a sense of classroom community.

Social Presence and Sense of Community

Issues of social presence and community are recurring themes in research about online teaching and asynchronous learning. Researchers emphasize the importance of forming a learning community in online education, and the crucial need for such community in order to foster collaborative learning (Brown, 2001; Dewiyanti et al., 2005; Doherty, 2001; Murphy, 2004; Rovai, 2000 and 2002; Shea et al., 2006; Vonderwell, 2002). They stress that development of community is mandatory to the success of online courses, and that online courses without collaboration or community are undesirable because they focus on merely transferring information rather than on building knowledge. One of the most important factors related to developing this sense of community in an online environment is social presence and feeling of belonging among the participants (Ubon & Kimble, 2003; Rovai, 2002).

Current research suggests that for an online class to be successful it needs to promote some element of community. Learning community, which can

be defined as “the social and intellectual interaction that occurs between and among students and instructor” (Doherty, 2001, p.12), is said to be central to any successful learning environment. It has an even greater impact in online asynchronous education since the students and instructor are physically separated from one another. Building online learning communities that have a sense of belonging and shared educational goals will help students to feel connected and enrich the quality of their learning experiences, and it is therefore extremely important to provide a strong social presence in combination with the delivery of content within an online learning environment (Rovai, 2002; Shea et al., 2006).

A qualitative study by Brown (2001) aimed to develop a theory regarding the process through which community is formed in graduate level asynchronous distance learning classes, and found that this process of forming a community of learners is an important issue in online learning because of the effects that it has on student satisfaction, retention and learning. Shea et al. (2006) are in strong agreement with this theory, claiming that it is crucial for researchers to understand how the online classroom impacts learners -- both socially and academically. Fifteen steps were identified in Brown's process of community building, each involving a greater degree of engagement than the previous step, with modeling, encouragement, and participation by the instructor helping to more readily form a community. Level of community was closely linked to high levels of course engagement and interaction, but questions still

persist regarding the capacity for fully online environments to support high levels of community (Brown, 2001; Rovai, 2000).

Issues such as limited access to the internet (and therefore the course itself) were found to have a major effect on the social process of forming and supporting a collaborative learning community (Wegerif, 1998). This was cited as a key reason why some students contributed little and felt left out of, or excluded from, the course. Ubon & Kimble (2003) identified social presence and sense of inclusion as the most important factors that help people actively collaborate. Findings from their research study provide an understanding of how online participants projected their social presence across distance and time using text-based communication, and shows that people need some time to develop a sense of group cohesion in a community, especially in an online context.

Interaction and Collaborative Learning

A sense of social presence and community must be formed to create this group cohesion, and the unity between class members will then enrich interaction. It isn't until a sense of community is formed that interaction can move to the next level and become collaborative (Murphy, 2004; Wegerif, 1998). Collaboration begins with communication between the students, but successful collaborative learning, which results in more student involvement with the course, involves more than just this student-to-student interaction (Benbunan-Fich & Hiltz, 1998).

Murphy's (2004) study sought to develop a preliminary instrument designed to assist in the identification and measurement of collaboration in online asynchronous discussion, stating that collaboration must be specifically and consciously promoted in order for interaction to lead to collaboration in ALNs. Six processes served as the main categories for the instrument, "social presence" being the lowest process and "producing shared artifacts" as the highest, with the earlier processes serving as prerequisites for the later ones. However, it was found that the earliest processes may occur without ever moving forward to higher levels of collaboration. Findings from this study also showed that shared goals manifest themselves differently in an online environment than in one where participants interact in each others' physical presence.

Dewiyanti et al. (2005) conducted two studies in order to reveal whether giving students specific guidelines can foster effective collaborative learning, seeking to determine if the type of instructional setting influences participation, interaction and student experience, and they found no significant difference in these areas. Like Murphy, Dewiyanti et al. stressed that students who collaborate effectively in face-to-face sessions will not automatically demonstrate such abilities online. This research has shown that more effective student-to-student interactivity takes place when there is both initial student orientation to the online learning environment and learning activities showing them how to use asynchronous discussion efficiently.

Whereas in the traditional setting students need to be physically present in a classroom to engage in learning with others, students in online classes can engage and communicate with each other when it is most convenient, respond at their own pace, and have equal opportunity to express themselves (Shea et al., 2006). A study by Schellens & Valcke (2006) shows that group size is significant in such discussion groups, finding that smaller groups of students produce both larger proportions of and higher levels of knowledge construction. Caspi et al. (2003) also undertook a study to examine the effect of group size on instructional discussion groups. As they sought to understand the impact of group size on patterns of interaction, they found that the number of student participants was in negative correlation to the proportion of instructor messages, indicating that instructors of smaller groups posted significantly more than those of larger sized groups. These studies show that group size is of consequence in the online environment. While most students posted a small number of messages, an increased number of active participants did not result in an increase in the number of contributions per participant (Schellens & Valcke, 2006). Furthermore, there is more instructor interaction in smaller online groups, which contributes to the feeling of community in the learning environment (Caspi et al., 2003).

Evidence shows that collaborative learning strategies, which require relatively small classes or groups that are actively mentored by an instructor, are necessary in order for online courses to be as effective as traditional classroom courses (Vonderwell, 2002). Vital to effective online learning is a

collaborative learning environment in which learners interact by negotiating, debating, reviewing, and reflecting upon existing knowledge, and are thus able to build a deeper understanding of the course content. Simply making the technology available to students is not enough to ensure their satisfaction with this process, as pointed out by Ocker & Yaverbaum (1999). Their research stresses that students should be better educated to the benefits of online collaboration and only after students are accustomed to this new form of collaboration will they feel it to be beneficial.

Instructor guidance and support are important aspects for communication and learning in online environments. Research attests that it is important for instructors to be aware of the factors that can hinder communication in such learning environments and know that barriers to communication can be overcome with effective, deliberate planning (Vonderwell, 2002). However, while facilitating and supporting interaction between students in a cyber classroom has the potential to promote collaboration, it does not guarantee it. This is because collaborative learning is more than mere interaction between students; rather, its intent is to solve a problem, create, produce, or discover something (Murphy, 2004).

A potentially negative feature of any online course is the loss of social relationships and sense of community that typically exists on a traditional campus (Dewiyanti et al. 2005). Collaboration serves to reduce these feelings of isolation that may occur online. However, when students do not see each other and thus feel anonymous, they may not feel obliged or pressured to

participate in group discussions and will not collaborate unless collaboration is structured into the course (Vonderwell, 2002). On the other hand, it is also possible for a student to participate and post online while not necessarily feeling like a part of the group, and findings from Wegerif's (1998) ethnographic study found that individual success or failure in a course depended upon the extent to which students were able to move from feeling like outsiders to feeling like insiders. Factors such as features of the course design, the role of the instructor, and interaction styles of the course participants also strongly influence this important shift from feeling excluded to feeling like part of the group (Swan, 2002; Wegerif, 1998).

Student Satisfaction and Learning Effectiveness

While online education provides an extremely convenient way for students to further their education, it is important to look at issues of learning outcomes and student satisfaction with this delivery method. Research does suggest that asynchronous learning provides a high level of satisfaction for many students, particularly regarding flexibility of time and place for learning and the emphasis on interpersonal interaction (Rovai, 2002). However, a recurring issue in the literature is whether or not the use of ALNs enhances the educational experience in a significant, quantifiable way.

In studies that looked at grade point average, average final exam grade, post-test questionnaires, student course evaluations, and student evaluation of the instructor, no significant outcome differences were found between

traditional courses and those delivered by ALNs. Therefore, it was determined that the use of ALNs can be as effective as the traditional classroom for conducting collaborative activities (Benbunan-Fich & Hiltz, 1998; Dewiyanti et al, 2005; Novitzki, 2000). However, an issue that has received considerable attention is the low quality of learning attainment perceived by some educators and students (Rovai, 2002).

A survey from 23 different asynchronous classes at a community college shows that it is important for instructors to be aware of how students are going to react to the virtual classroom (Hastings, 2000). This survey research found that while many believed that they could learn as much as in a traditional classroom, most of the students were unsure that they could learn as well in the online classroom. Research also shows that the most significant benefits of using ALNs occur when there is moderate to high usage of them (Novitzki, 2000) and that time spent on task and participation are vital in successful online learning (Morris et al., 2005). Discussion groups were found to be a feature that worked well for some students but did not work as well for others, and because of this it was deemed important that instructors use varied methods of delivery of information.

In contrast, work by Ocker & Yaverbaum (1999) found that the asynchronous online environment was inferior to the traditional classroom setting in terms of student satisfaction with the learning experience. Although the asynchronous groups of students were just as satisfied with the end product (i.e. amount of learning that took place and GPA), they were less satisfied with

the actual form of group interaction. More in-depth research by Swan (2002) studied 3800 students in 24 different online courses and had them rate their perceptions of their courses across various dimensions (including learning, interaction with instructor, interaction with classmates, and their personal level of activity). The factors that were found to contribute most significantly to the success of online courses were a clear and consistent course structure, an instructor who interacts frequently and consistently with the students, and relevant, active discussion. The more interaction students believed they had with the instructor, the more satisfied they were with the course and the more they felt they had learned. There was also significant correlation between students' reported levels of activity in the course and reported satisfaction and learning (Swan, 2002).

Doherty (2001) determined that there also is a significant relationship between student satisfaction and student-student interaction in an online course, but this finding did not significantly correlate with student success as measured by GPA. As in Swan's study, the variable predictor of student success discovered in this Doherty's correlational research study was student perception of student-instructor interactions, as measured by both GPA and student satisfaction. The same study also found that while the most significant disadvantage of online learning identified by respondents was the lack of face-to-face interaction, nearly a third identified no single disadvantage among the options provided on the survey.

In order to assist others in developing and testing their own e-learning theories, an international study was undertaken by Wang (2003) to develop a comprehensive model and instrument for measuring learner satisfaction with asynchronous online learning. He sought to examine the factors that influence user satisfaction, and found that personalized feedback had the greatest impact, with course content and course interface also being top factors for determining satisfaction. Likewise, Swan (2002) reported on the relationship between course structure and student satisfaction and found that it is important to have a suitable interface that meets students' needs when considering a learning system.

Conclusions and Implications for Further Research

Online education has become central to learning in higher education by offering exciting opportunities for new ways of learning and teaching, and commitment to quality technology-based education has become a major priority for institutions of higher education. The research literature has shown that a strong sense of community is necessary to enhance communication and learning satisfaction, that instructor interaction and sharing and learning from others, collaboration, is of very high significance, and that course material must be presented in a way that is user friendly. These studies have also stressed the critical need to measure satisfaction in order to evaluate whether the asynchronous learning networks that are currently being implemented actually meet the students' needs. As technology evolves, its use and place in

education and the dynamics of interaction that it allows in online learning must be continually reviewed and new research conducted.

While research has led to great insight into how online learning can support the needs of college level learners, important questions still remain that will enable programs at universities continue to grow and improve their technology initiatives. The number of online courses and degree programs is rapidly increasing, and as such a great number of higher education teachers must be prepared to plan and design distance education instruction. To do this requires instructors to understand what technology can and cannot do relative to delivering desired instructional methods, stimulating interaction, and supporting instructional goals and outcomes. However, the studies reviewed did not provide sufficient, specific guidelines and suggestions on how to design effective asynchronous online instruction in order to encourage interaction and learner satisfaction. There is a need for further research that focuses on whether or not instructors are prepared to teach online. This research should encompass the training, support staff, and development tools that are necessary to design effective instruction for this type of learning environment.

Additional research is also needed in specific areas of online asynchronous learning and teaching in order to find out if there are some subjects for which this type of course delivery is not suitable, and also to examine the relationship of gender and cultural differences to aspects of online learning. By investigating these issues we can be better prepared for successful and effective adoption of new technology and the benefits that it offers for

learning and teaching in higher education. While online learning offers obvious advantages, there is still much more to learn about how students can best make use of the computer and internet in their educational endeavors, and further research is needed to confirm that learners are actually acquiring and using the skills that are being taught online and that online learning is the best way to achieve learning outcomes.

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