ALN For AIS:

A Case Study of The Application of an Asynchronous Learning Networks Approach to an Accounting Information Systems Course

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Abstract

Many universities are implementing courses taught over the Internet. Much of the work in this regard falls under the definition of Asynchronous Learning Networks (ALN). Development of ALN techniques has been widely supported by grants from the Alfred P. Sloan foundation over the last five years. ALN courses are anytime, anywhere applications and are applicable to university courses taught on campus, off campus and through extension facilities. ALN elements and techniques are evolving but there is general agreement regarding some approaches. This paper will explore the development of ALN applications generally and will describe the application of the approach to an Accounting Information Systems course at a Western state university. The description will report on techniques employed, how they worked, how they were received by students, what will be added the next time, what will be changed in the future, and an overall assessment of how the course was perceived.

Introduction

*H*ow would you like to change your teaching role from "sage on the stage" to "guide on the side" and, to boot, deliver your course over the Internet using new, exciting technology and pedagogy? If you would like to do this, or if your school or business wants to do this, then you may wish to consider techniques known as Asynchronous Learning Networks (ALN).

Readers with questions or comments are encouraged to contact the authors via e-mail.

In this paper, there is a definition of ALN and exploration of how the technique has developed in the United States over the last five years. There follows a brief discussion of the applicability of ALN to different disciplines and an explanation of some of the generally accepted ALN techniques. Then, there is a description of how ALN elements and techniques were applied in an Accounting Information Systems course at a Western state university. Following this description is a presentation of observations about how successful the application was and some suggestions about how others might wish to pro-

ceed with similar applications

Definition of ALN

A popular definition of ALN comes from the ALN web page found at http://www.aln.org. "Asynchronous Learning Networks (ALN) are people networks for any-time-anywhere learning. ALN combines self-study with substantial, rapid, asynchronous interactivity with others. In ALN learners use computer and communications technologies to work with remote learning resources, including coaches and other learners, but without the requirement to be online at the same time. The most common ALN communication tool is the World Wide Web."

"By this definition, a web-based workshop that requires frequent online conferencing and collaboration with others is ALN. So is a text- or computer-based training course that requires learners to use email to discuss assignments with each other or with the coach. ALN also encompasses a proctored examination at a specified time and place, or occasional synchronous chat or lab sessions for near-campus learners, or an in-person kickoff meeting."

"By this definition, distance education based primarily on a synchronous audio or video presentation or conference is not ALN because these constantly require learners and instructors to be available at the same time. A videotaped course or mail-based correspondence course or computer-based training is not ALN because these do not include substantial and rapid interactivity with others, even though the learner might mail in a paper or test and receive a reply days later."

ALN Development

The ALN group at Vanderbilt University maintains the ALN web page. It is one of the schools initially funded by the Alfred P. Sloan foundation in its program for "Learning

Outside the Classroom." The Sloan program commenced in 1993 and awarded funds to the University of Illinois, the State University of New York (SUNY) system, Penn State University and a few others who were early adopters of ALN techniques. (Bourne, 1998).

One of the reasons for ALN applications being widely adopted has to do with the perception that significant economies of scale can be achieved by spreading educational resources across more students. Once a course has been built and the online resources put in place, then student access and enrollment are no longer bound by time, place and facilities. An instructor and "assistant coaches" can minister to more students using ALN than is possible using traditional synchronous approaches.

More recently, universities, colleges and training organizations have begun to appreciate the pedagogical advantages of ALN courses. The emphasis placed on student collaboration, with coaches and with each other, in a sophisticated technological setting is seen to be advantageous to students in many applications. It's true that some applications are more suited to ALN than others, but more and more institutions are taking the position that ALN may be pedagogically superior.

A course where explanation of concepts and illustration of principles can be accomplished or enhanced by slide shows, videos, or other multi-media presentations lends itself to ALN. Courses where students collaborate with each other on term projects or in other joint endeavors can benefit from ALN techniques. Courses that require long periods of discussion of abstract concepts led by a face-to-face instructor probably would not benefit as much by this technique.

An inspection of the course listing from the ALN web site at www.aln.org/coursedirectory/list.cfm shows that of the more than 200 courses listed, most were computer science or information technology courses. Some other dis-

ciplines listed were biology, math, engineering, education, history, oceanography and psychology. Universities listed with several courses included Stanford, Illinois, New Jersey Institute of Technology, and SUNY.

ALN Techniques

Bourne (1998) notes that a principal difference between a traditional course and an ALN course is that the instructor's role changes materially. He/she goes from being a lecturer to being a "coach." In order to accomplish this role, the instructor must prepare much of the course materials more thoroughly and must make them available to students online. Then, the instructor must arrange for communications with students, and among students, asynchronously.

Bourne, et. al (1997) list the major paradigms in use in ALN at that time:

" *Use of computer conferencing for: submission of homework, discussion of issues, and help. Online materials that include: syllabus, assignments, reading, problems, Interactive Learning Modules, Course Management, homework submission and instant grading, roll-ups of student progress, Interaction with students, email, listservs, Audio clips of lectures, real-time audio, downloadable audio, Video clips of lectures, real-time video, and downloadable video.* " *(pp. 40 –41)*

Since 1997, new technologies and new products have come to market that make the ALN instructor's job easier. For example, new conferencing systems make posting of questions, answers, and comments to threaded discussion groups easier and more informative. Streaming media facilities are much enhanced through development of more powerful RealAudio and RealVideo resources by RealNetworks and by Microsoft's entry into the field with its NetShow resources. Web browsers have developed into more powerful programs and email software enables much more functionality. Faster and more

powerful microprocessors and cheaper RAM have enabled personal computers to become better "clients" to the web servers and are more useful tools. The principal technological problem still seems to be "bandwidth" or the "size of the pipe" down which all Internet traffic must travel to reach client computers.

Most of the paradigms listed above are available for use at most universities and colleges in the United States today. This is not to say that most faculty know how to make use of those paradigms presently. But, an investment of time and curiosity is likely to lead interested faculty to apply ALN techniques to their courses if they are so inclined.

Applications Of ALN Techniques To An AIS Course

In Winter term, 1999, the first ALN course presented in the College of Business and Public Administration at one of the California State Universities was the Accounting Information Systems course. The instructor had been the recipient of two Learning Productivity grants which enabled acquisition of server hardware and software and application software to support design of the course. The instructor attended two conferences concerning technology in education, including the annual conference on ALN in November, 1998.

Server

The grant enabled purchase of a Dell Computer Corporation server. It now has two Pentium II 233 Mhz processors, 192 Mb of RAM, and two hard disk drives with total capacity of 13 GB. The operating system is Windows NT 4.0 (server). It runs Microsoft Internet Information Server (IIS) software to host web services. The server runs Microsoft's NetShow and RealNetwork Server to support streaming media. The server is housed in the College of Business and Public Administration and is looked after by the technology person employed by the

college. It is connected to the University network which, in turn, is connected to the outside world for Internet access. Anyone with a browser anywhere in the world can access the server over the World Wide Web.

ALN Elements Employed

The Accounting Information Systems course was offered as an Internet course in the official class schedule for the University. The notation in the schedule book carried the instructor's email address and interested parties were invited to send email messages requesting information. The instructor responded to questions by directing questioners to a Frequently Asked Questions page stored on the server. Email responses contained a hot link URL to the FAQ page. The instructor answered questions that were not on the FAQ page by email.

The course has its own web site on the server. The server's home page is organized so that visitors can "drill down" to find course sites and other departmental information using links. The server is administered technically by the technology person in the College of Business and Public Administration. The overall web site is administered by the AIS instructor, as are web sites for his specific courses. There are sites for a tax course and a graduate audit course to be offered as Internet courses next academic year and sites used for "web assisted" courses. In these latter courses, instructors use the sites to post their syllabi, assignment sheets, class notes, problem tips and solutions, and other matter. Access to sites is under the control of the Windows NT operating system and can be secured using a familiar user name/password scheme. The individual instructors build and maintain the web sites of the courses for which they are responsible.

The administration of the web sites is done using Microsoft's FrontPage 98. (Jones and Randall, 1997) This program permits fairly straightforward building of web pages and man-

agement of web sites. The page-building program operates much like Microsoft Word and turns out pages that are in standard HTML format. The program also edits HTML pages easily and effectively. The site management program looks and feels similar to Microsoft Windows Explorer, permitting "drag and drop" movement of files and folders on the server and between a local client computer and the server, under FrontPage control.

Online Materials

Syllabus

The course syllabus is stored on the web site for the Accounting Information Systems course. The text used in the course is *Accounting Information Systems 4th ed.* by Gelinas, Sutton, and Oram. PowerPoint slide shows are available from the publisher to adopting instructors and a companion volume, called *PowerNotes,* is available for adoption. This latter resource has thumbnail sketches of the slides in the slide shows, three to a page with room alongside for student notetaking. The syllabus has links to the slide shows that are stored on the web site. The syllabus may be downloaded by students in either HTML format or in Portable Document Format (pdf), using Adobe Acrobat Reader software loaded on student client computers.

Assignments

Some assignments require students to download problem data files so that they can solve the problems on their local computers. There are links on the assignment sheet to the downloadable files located on the course web site. The assignment sheets can be downloaded in either HTML or pdf format.

Course resources

The course requires some software resources that students might not have loaded on their computers. Plug-in programs from Adobe,

RealNetworks, and Microsoft are available for download directly from the server, instead of requiring the students to go to the relevant web sites of these companies.

A "What's New" Page

One way of broadcasting information to all students in the class is to have a page that all students inspect regularly. This "What's New" page brings students up to date on new assignments, new course features, changes in schedules, and the like.

Slide Shows

The slide shows that come with the text are stored on the web site. The instructor has narrated lecture comments to accompany the slide shows and the narrated shows are available for student viewing as streaming media files or as downloadable files. If the students choose to stream the files, they must have either Microsoft Media Player or RealNetworks RealPlayer software resident on their client computers. Streaming causes a delay of several seconds of buffering time before the show begins to play on the local computer. Downloading may take several minutes because the files, with audio, may be several megabytes long. Even when these files are compressed, they take a relatively long time to download. Students may view the downloaded files either in PowerPoint on their local machines or using a PowerPoint viewer program, itself downloadable from the web site or from the Microsoft web site. The students watch/listen to the shows and take notes in the *PowerNotes* book that they purchased from the campus bookstore.

Homework problems

Many of the assigned homework problems use cases published in the text. The instructor, however, provides instructions, cases and data files for some problems. These problem resources are downloadable from the web site. At set dates, students submit their homework by including their solutions as attachments to email messages sent to the instructor or student assistant. The assignments are graded and notification of the score sent back to the student via email. If need be, the instructor or grader can make notations on the solution attachment and send it back to the student. If the students have questions, they may inquire directly to the instructor via email, telephone, or in person during office hours or by appointment. Students may also address questions during chat sessions or via a threaded discussion group.

Chat Sessions

During this Internet offering of the course, there were several chat sessions hosted by the instructor. Students joined the sessions from their home or business computers. The sessions were held synchronously at a time announced on the What's New page and were accomplished using Microsoft NetMeeting software. (Summers, 1998). This software product permits multiple users to join together in a session where they can communicate by using microphones to simulate telephone calls, via small video cameras to accomplish online conferencing, or by typing messages to one another in what is referred to as "chat" mode. Because of bandwidth limitations, "many to many" participation is presently limited to this latter mode. NetMeeting software is free and is downloadable either from the web site or from the Microsoft web site.

During chat sessions, students ask the instructor to clarify points in the slide shows or to comment about homework, exams or anything else they are interested in. The instructor responds and encourages discussion. The chat sessions in this term lasted from one to two hours. NetMeeting software records the text of the chat sessions and permits the host of the meeting to save the transcript. In this case, the instructor saved the transcripts of the sessions as Microsoft Word files, converted the files to HTML format and then posted them to the web site. Students

who were unable to tune in to the sessions, which were done synchronously, could download or read the transcript of the sessions.

Examinations

ALN courses, in general, aim to make use of web-based examinations and quizzes. Curiously, software to do over-the-web exams is not abundant. In the session of the course described here, there was a mid-term exam and final exam. Because this was the first offering of the course over the Internet, it was decided to make these exams synchronous and all students came to a classroom at the university and took the exam in the normal fashion.

Internet Assignments

In addition to the normal assignments for an AIS course, there were three assignments where the students used the Internet to find information that complemented their other work. They were asked to use search capabilities to research a company of their choosing, to "find a job" and, to enhance their study of system development issues, to search for accounting software packages.

Observations About The Success Of The Course

The instructor taught one section of the AIS course in the traditional manner at the same time that he taught the Internet course. Initial course enrollment was 25 for the traditional course and 24 for the Internet section. One student dropped the traditional course (typical for the university) and three students dropped the Internet course. Reasons for these latter drops had to do with work schedules and personal difficulties - not the fact that the course was offered online.

The grade distribution for the two courses was similar. The grade point average distribution in the web course was slightly higher

(2.57) than the traditional course (2.33). Of course, the relatively small number of students in each of these makes generalization from the statistics suspect. One possible explanatory variable for the higher GPA from the web course might be a self-selection bias. Students who chose to take the course online may have a more sophisticated knowledge of computers, which may benefit them in a course where computers are a significant topic.

Anecdotally, students who took the online course commented that they found the experience to be refreshing and stimulating. Many of them commented further that not being required to be on campus to attend class meetings was attractive because it freed up time that they could spend at their jobs or with their families. They found that if they were able to schedule attention to the course at their convenience, they were positively disposed toward the experience.

Some students in the online course experienced frustration. Some of the exercises, like NetMeeting sessions and downloads of slide shows, were new to them and they experienced normal confusion and discomfort. Then there was the typical problem of "the server was down." There were some occasions when the server was not accessible due to technological problems at the server, college or university level. Then, there were other problems at the student computer level, with the student Internet Service Provider, or with traffic problems over the Internet. Students tend to characterize any and all of these difficulties as "the server was down."

What Might Have Been Done Differently

The instructor was caught up with learning how to administer a course online at the time he was administering a course online. There was a definite learning curve as with any unfamiliar undertaking. Some of the things that could/should have been done differently are described below.

Threaded Discussion Group

Use of threaded discussion groups is highly recommended by those who successfully administer ALN courses. These groups are computer-based, listserv-type sites where instructors and students can post questions and answers and engage in discussions of issues. These sites are termed "threaded" because the discussions are posted to the site under various topics that are initiated by the instructor or students. A major value of these sites is that they remain available for viewing by anyone concerned with the course. Availability of this material and the capability of participants to post messages to it enhance the asynchronous nature of these courses.

The instructor experimented with different approaches to threaded discussion groups during the term, but did not implement this element successfully. FrontPage 98 offers the capability of setting up these groups but has some limitations. It is hoped that the version of FrontPage that is in the new Microsoft Office 2000 suite will be more capable. Plans are to introduce threaded discussions early during the next offering of the AIS course over the web.

Narrated Slide Shows

The technology of streaming media from the Internet to client computers is changing rapidly. At the start of the term discussed here, there were three options available to deliver narrated slide shows to students: via CD-ROM, as downloadable files that students would play on their local computers, and as streaming media files. The instructor experimented with all of these during the time that the course was going on, concluding about half way through the term that offering both of the latter two techniques was the best solution. In the future, these two will be pursued from the start.

Chat Sessions

NetMeeting permits the host of a chat session to broadcast, using audio, a narrated slide show with the slides appearing on the screen and manipulable by the instructor as he narrates. Alternatively, software is available to deliver lectures in this fashion, synchronously, and then process student questions/comments that are entered by them in typed "chat" mode. The instructor plans to offer these synchronous conferencing sessions, which students may access voluntarily. In any event, the narrated slide shows will be made available for download or streaming.

Online Quizzes And Exams

A major reason for the administration of exams synchronously at the university in the first offering of the course was uncertainty regarding security. Acquisition of powerful exam administration software will soften this uncertainty. In the future, the plan is to offer quizzes with immediate feedback online and to administer all exams over the Internet.

Conclusion And Suggestions

Asynchronous Learning Networks methods are maturing and are available to most universities, colleges and businesses in the United States. Some courses are more amenable to being taught over the Internet than others. The Accounting Information Systems course is a good candidate for ALN presentation for several reasons. The course centers on computer processing and the students are usually fairly computer-literate. Using slide shows can enhance presentations of relevant data, in the form of data flow diagrams and system flowcharts, and these shows can be easily incorporated into ALN courses. Students taking an AIS course are likely to be interested in a technologically innovative presentation approach.

The AIS course described in this paper was a first effort at applying ALN techniques. It was judged successful by comparing results between the performance of web-based students

and traditional students, using the same instruments of evaluation. Anecdotal comments by students were, on balance, favorable.

AIS educators who think that their courses may be good candidates for ALN presentation may wish to delve into just what ALN is all about. A good starting point would be to go to the ALN web site at http://www.aln.org. The site contains a rich collection of information about ALN, including online versions of *The Journal of Asynchronous Learning Networks* and *ALN Magazine*. There is also a series of threaded discussion groups, which center on ALN and associated issues.

With universities, colleges and businesses moving more and more toward Internet or intranet presentation of courses, be they for-credit, extension or continuing professional education courses, use of ALN techniques will surely expand. Applying ALN to AIS education seems like a natural move. 📖

Notes

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