Reflections On Developing And Using Blended Courses In An IS Program

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ABSTRACT

There is very little research into blended learning integrating online with face-to-face instruction. This paper presents some experiences in developing and implementing blended learning in several courses of an information systems (IS) program at a state university since 2004. The primary purpose of introducing elements of blended learning at the university was to reach a wider student community. Some reflections and lessons learned are presented on methodological, technology issues, as well as faculty and societal issues, followed by suggestions for further work.

Keywords: blended learning, on-line education, IS education, continuing education.

1. INTRODUCTION

Blended learning involves courses that integrate online with face-to-face instruction in a planned, pedagogically valuable manner (Swan, 2007). Blended learning is the combination of different training "media": technologies, activities, and types of events to create an optimum training program for a specific audience (Alvarez, 2005). Turoff (2006) points that a current policy challenge in higher education is how to make all courses blended by introducing the required technology to integrate on-campus instruction and distance learning. There is very little research into blended learning (Swan, 2007), a notion that became better known only in 2005 as a label of a trend that was gradually evolving over the last several years from several fields like web-based education (see Aggarwal, 2003).

This paper presents some experiences in implementing blended learning in several courses of an information systems (IS) program at a state university since 2004. The primary purpose of introducing elements

of blended learning in our university was to reach a wider student community and to serve thus better the population of remote areas of the state who would have difficulty attending university. Thus the work reported here was seen as a way of strengthening the position of the university within the local community. The previous discussion brings us to the link of blended learning and localness – a phenomenon linked to education only recently. According to Mayadas and Picciano (2007), localness is a term used at the Alfred P. Sloan Foundation as part of a new funding initiative to support academic programs designed to strengthen a college or university connection to its core constituencies. The goals of our work however have evolved over the last two years due to realizing that we can use the materials in several ways: for teaching of classes in a combination of face to face and online instruction, for inclusion of online materials in teaching of on-campus classes and in implementing the concept of a distributed classroom where we have a core student group on campus and a few students at one or more remote locations who may participate in a synchronous way in

class or who may be fully online participants in an asynchronous way.

The aim of this paper is to share our experiences in developing multimedia and online instructional materials for blended courses in the IS program used for offering various types of classes and to outline a potential future developments. The importance of such activities is related to the need to use the available educational technology in ways enabling us to serve flexibly a dispersed student population located in small groups or individually and thus addressing partially the problems of reduction of student populations in computing programs.

The Business Information Systems (BIS) program at Eastern Connecticut State University (ECSU) was approved in January 2003 by the Connecticut Department of Higher Education and was started in the fall of 2003. Currently it has around 40 majors and 35 minors as well as a few Bachelor of General Studies (BGS) students with an IS concentration within an overall undergraduate student population of over 5000. The university is located in a small town in a predominantly rural area. As a new program we faced similar enrollment problems as most other IS programs over the last five years and hence reaching out to a wider student community was vital for its survival. The latter goal was in line with the dedication of the university to serve the population of the relatively less developed Eastern part of Connecticut, which included centers like New London and Groton. They host some large companies like Pfizer and a number of small high technology firms. The area features strong presence of military establishments, a growing tourist industry and numerous non-profit organizations.

A cohort of the BGS in BIS was planned by the School of Continuing education for the 2004- 2005 academic year. It had just 12 students. We concluded subsequently that in the future it would be more likely to get occasional additions to the BIS program in Groton and Rockville instead of a cohort. Thus the question for us was how to respond to the needs of such occasional students and how to use flexibly the online and multimedia CD materials. We started with the development of a combination of WebCT

and multimedia CDs for non-traditional students in May 2004. We produced by February 2006 such materials in four IS courses: information management, information systems and web technologies, systems analysis and design and database design. Three of them were used in 2005 and 2006 with groups of students who studied with the multimedia disks and WebCT materials on their own. They had on the average four group sessions with the instructor on location in Groton. This corresponds to *the program-flow approach of delivering blended courses* (see Bershin (2004) and Alvarez (2005)). The first group session was the "kick-off event" as it is labeled by Bershin (2004), followed by two sequences of self paced learning and feedback session which were concluded with the final session after the exam. Its aim was to provide feedback and reflection on what was learned during the course.

Since January 2006 we introduced audio conferencing and WebCT combined technology in our capstone subject on IS strategy, linking our main campus and a satellite lab in Groton as a distributed classroom. A small group in Groton participated in a synchronous session with a class in Willimantic. It used online materials for both groups. This approach resembles more the second approach discussed in Bershin (2004) and Alvarez (2005): *the core-and-spoke approach*, where various media and materials can be involved in flexible way as the needs develop. We agree with the conclusion of Alvarez (2005) that this is a flexible way of tailoring materials to the learners' needs as the technologies and tools become available. Subsequently a video-conferencing technology, Adobe Connect (previously known as Macromedia Breese) was tested during the Fall of 2006 in Business Information Systems and Web Technologies and was used in the Spring of 2007 both in that subject and in IS Strategy.

The previously mentioned multimedia CDs were used as additional materials in Information Management, Systems Analysis and Database Design during day classes on campus since the Fall of 2005. Pure on-line classes in two BIS subjects were offered in the summer of 2007, one of them using also the multimedia CDs in addition to WebCT. During the Fall and Spring semesters of

2007/2008, our combination of blended learning materials and a distributed classroom technology is used to enable flexible participation by Continuing Education Groton students in 7 BIS subject sections, taught by three instructors.

The implications of introducing blended courses are discussed at a theoretical and policy making level also by Turoff (2006): "The fundamental change that has brought this about is the introduction of blended courses where the face to face student is utilizing the same technologies that are utilized by the distance students. This provides the faculty member the option of treating any mix of distance and face to face students as one class, utilizing the same prepared material, and able to participate together as part of one class whether they are distance or face to face."

The policy challenges to higher education in implementing the necessary transformation towards implementing blended learning are grouped by Turoff (2006) into *methodological issues, technology issues, faculty issues, and societal issues.* We agree with all of his recommendations. However we will focus here on a few of our experiences in implementing blended learning courses which for convenience will be presented along the same four dimensions suggested by Turoff (2006) that will serve as an organizing framework for the discussion.

2. OUR METHODOLOGY RELATED LESSONS

We followed a typical course design process having the following steps:

1. Analyze the learner population.
2. Identify the desired learning outcomes or course objectives.
3. Identify the learning activities to achieve the course objectives.
4. Identify the course design options and technologies to be used.

The following paragraphs will present some of our reflections on each stage.

Analyze the learner population

We found that non-traditional adult students are highly motivated learners. They are very well organized, have already substantial business experience and want to learn more to improve their work productivity or to obtain a better job.

At the same time we identified that some of the students interested in online education are in fact associating it with false illusions that it will be an easy way for them to take a class which otherwise they would have to attend as day time students.

Tallent-Runnels et al. (2006) have found that students have positive attitudes about online learning, and that computer anxiety is not a problem for most students. On the other hand, I share the opinion of other colleagues that young learners lack basic technological preparedness. Hence one wonders whether it is a myth that the current generation is more technologically savvy. That seems to be true with respect to some technologies like the use of the Internet and cell phones but a similar conclusion cannot be made about the use of MS Excel or Access.

Vendors of course management software like WebCT or Blackboard claim that their products are easy to use but we realized that no student can be expected to know them – hence the need for the video guides that we developed and the need for a future non-credit introductory course on basic understanding of online education technology.

Our classes consist of both full time day and evening students and non-traditional adult working students wishing to obtain an IS qualification. Some of them have already experience in the IT industry. A mixed mode student may take some classes on campus, others in Groton and further participate in classes for non-traditional students. Hence the materials may be used either to enhance day classes or for distance education.

We recognize the willingness for hard work of adult learners and their wealth of knowledge, as well as their varied learning styles. The preparation of course materials that serve them and day time students is

posing a considerable challenge due to the diverse needs of both groups.

Identify the desired learning outcomes or course objectives

The desired learning outcomes are defined in the program documentation approved by the state department of education which was influenced by standard curricula recommendations like IS2002 (Gorgone et al., 2003). We believe that classes for non-traditional students cannot have different goals and objectives from those for traditional students and they need to have the same quality.

Identify the learning activities to achieve the course objectives

IS blended courses involve hands on work, team projects, critical thinking, and skills enabling active learning. The learning activities were derived from the analysis of the characteristics of adult learners and also from the standard recommendations for IS Curricula by ACM/AIS (see Gorgone et al., 2003). An essential issue is assessment of student learning. Our program has not achieved yet the level of the assessment process reported by a department at a neighboring university, documented in Petkova et al. (2006). However we have established our own plan and within separate subjects have developed and tested with day time classes rubrics for project assessment of student learning (see Petkov and Petkova (2006)). These were not used so far however for assessment of learning in blended courses and for drawing conclusions on its effectiveness.

Identify the course design options and technologies to be used

After a careful consideration of the experience of others (see Janicki and Liegle, 2001) and our own situation we concluded that:

- Instruction designed for adults tends to be more effective if it is learner-centered – everything was designed having students in mind, how will they see the course artifacts and use them.
- The instructor must maintain a careful

balance between the presentation of new material and its applications, discussion and participation by students - we used home assignments, miniprojects, team project, threaded discussions, email, and chat. Special attention was paid to the interaction within study groups and with the instructor.

- We adopted a standard structure of the WebCT courses for all IS subjects at ECSU – as a consequence the learning curve for students in various subjects was reduced,
- We developed for non-traditional students also video lectures on CDs using Tegrity and Camtasia (we use CDs instead of streaming video as not many have fast Internet)
- We started with an audio conferencing link between the Willimantic and Groton campuses in January 2006 and used since late 2006 Adobe Connect for video conferencing with the idea of creating a distributed classroom.

The next section deals with reflections on the next dimension of our analysis of experiences in implementing blended instruction.

3. WHAT DID WE LEARN ON TECHNOLOGICAL ISSUES

The introduction of blended learning required reassessment of the available facilities in our computer labs so that they can enable video conferencing. A bottleneck was created by the inadequate infrastructure of the computing facilities in the satellite campuses in Groton and Rockville. These labs were implemented originally on a very small, insufficient budget, with incomplete functionality. They needed to be an integral part of the university IT infrastructure and at the same standard level, which might seem a simple issue but in reality was not easy to achieve.

We experienced in our interaction with the otherwise very supportive Information Technology Division (ITD) staff within our university that it is not enough for the latter to demonstrate a concept, for example the

use of videoconferencing through Adobe Connect. Rigorous testing is needed to verify the functionality of the IT infrastructure, and how it copes with stress loads at peak times in every location where it is needed. We value highly the cooperation with our ITD staff doing always their best to meet our requests in spite of their limited resources. Improved results however could be obtained through a better coordination between the units of ITD for successful delivery of reliable academic computing infrastructure, involving not just the staff of the Academic Computing Unit (the Center for Instructional Technology at ECSU) but every other department in it - as might be needed in a particular situation.

The technology we used besides Adobe Connect was diverse:

- WebCT campus edition and subsequently WebCT Vista for a organizing standard sets of materials both for day classes and for online courses, having in mind that day students will use them mostly to reinforce classroom instruction.

- TEGRITY software for developing video lectures integrating Powerpoint presentations, voice and real time screen capture.

- CAMTASIA software for combining voice and screen capture,

- The Library electronic course repository system.

One of the outcomes of our effort was the implementation of a consistent uniform layout in the WebCT and multimedia disk materials for all classes. The latter were organized using the Lectora software. The recording of lectures was a substantial component of the process. Here is what we found from working with the Tegrity and Camtasia software:

- The hardship of talking in front of a camera and developing of proper communication style is usually underestimated by administrators and novices.

- A successful recording needs minimum three takes.

- The packages are constantly improving but still there is no flexible transition from one mode of operation to another.

- Incomplete documentation and some

bugs in the software were identified especially with the earlier versions of the packages.

- The vendors have paid little attention to the need for proper backup and version control to reduce the maintenance effort.

- Rudimentary time line editing only is provided by both packages.

- Inability to integrate material from different recording sessions is a drawback that prolongs the course development process.

Probably the most significant issue of technological nature is to have a clearly outlined long term policy within a university on the type of course management tool that will be supported and its integration with the university management systems. Another important conclusion is that the level of technical support provided to faculty is insufficient. The human resources of the Center for Instructional Technology are stretched to the limit. Its staff is otherwise extremely helpful and highly dedicated. The last four years have brought a significant increase in the use of academic computing tools by faculty at the university while the existing CIT staff has been in reality reduced due to an extremely slow replacement process after a resignation. The next section deals with other faculty and management related issues.

4. LESSONS ON FACULTY ISSUES AND THE MANAGEMENT OF COURSE DEVELOPMENT

Several steps were undertaken by the ECSU management to enable the implementation of blended learning:

- The university administration negotiated with the union the conditions of an agreement on the development of such courses and also on delivering such courses.

- Issues of copyright had to be resolved, leaving copyright with the instructor but allowing ECSU to use the materials as necessary.

- Issues of rate of remuneration and consideration of whether delivering such courses within or outside the standard

teaching load had to be resolved.
- Issues of cohort based delivery for the IS program had to be considered.

Our work was facilitated by the university wide initiative to introduce WebCT. The Center for Instructional Technology(CIT) organized extensive training in 2003-4 for all ECSU faculty on using the technology. Relevant materials and books on on-line education were provided by its staff.

We examined carefully the criteria for evaluation of the best published WebCT courses in the annual competition organized by that company (now part of Blackboard) and the best on-line teaching practices according to the literature. In addition we got help from the university Media Center in learning Tegrity and from the CIT in learning Camtasia. A student worker was employed by CIT with funding from the School of Continuing Education to assist in the technical work for the creation of the multimedia disks.

We view the development and introduction of each blended course as a journey for all of us, a process of team building that involves both students and the instructor. It required at stages some flexibility in the schedules but the objectives were kept and achieved. It required inevitably willingness and devotion of time to develop the new materials and teaching methods.

Below are some reflections on the management of blended course development at our university which may be valid for other environments as well.
- The current process of introducing a new educational technology is approximately as follows: CIT is an initiator of using a certain technology, it promotes it, demonstrates the concept, provides training and support, as a whole it does usually an excellent job with respect to the above; faculty are encouraged verbally to participate and sometimes there are incentives for developing courses like in our case (3 FLCs per course), user discussion forums are formed.
- Potential courses are selected on the basis of their perceived value to potential students, provided that their numbers

can justify economically a cohort of students to be formed within a specialist program.

There are several existing disconnects in the above process model which we observed:
    -there is no incentive for deep penetration in academic practice of new instructional technology as no monetary or other organizational incentives exist for its ownership to be taken over by the faculty;
    -the interests of academic computing technical staff inevitably tend to move on to the next emerging new technology over some time;
    -no steering committee exists at university level or at the level of the Connecticut State University System, involving professionals (who are appointed, not elected, as this is not about how representative is the body but rather how competent it is) and top management to advise on both academic and administrative computing;
    -the university annual report contains only a small general item on distance learning and on-line materials without requiring detailed elaboration;
    -there are some faculty related inhibitors to the promotion of technology use by a higher percentage of instructors: some faculty consider that this might be against academic freedom if requested to use technology while others simply need more technical training;
    -the technology of the distributed classroom that we used since January 2006 through the combination of video conferencing, multimedia materials and WebCT is an attractive idea but it needs very hard work in order to be implemented, adequate testing, going beyond the demonstration of a concept, improved network infrastructure and most importantly - better maintenance of technology and the multimedia materials;
    -some stakeholders within the university behave as if they interpret differently the question "Whose course is this?" Does it belong to the instructor, the department (and the respective academic school), to the School of Continuing Education or to the whole University? Maybe that is easy to answer in theory but in fact it is not so easy in practice. The coordinating mechanisms of the

University as a system need improvement and greater quality control of the contribution of every unit within the value chain that is involved in the process of delivering blended learning courses is necessary. The instructor ends up doing many extra activities alone in the "engine room" in order to facilitate the successful completion of a course section;

-some university administrators had false perceptions and underestimated significantly the amount of work involved in such type of teaching. That is against our experience and the empirical findings from distance education research (see Conceicao (2006), Swan (2007), Choi and Park (2006) and others).

The last conclusion is related both to faculty issues and to the next dimension of our analysis – societal implications from the introduction of blended education.

5. SOCIETAL ISSUES REFLECTIONS

The criteria that drive an administrative decision to offer or cancel a course involve simple rules for minimum enrollment in a section to ensure its viability. However, if no one can offer a course among several competing educational institutions just for the above economic reason, it is hard to estimate the damage to the society if it loses potential new IT experts because they had no opportunity to study.

The recent attention among universities to localness (see Mayadas and Picciano, 2007) is another factor that supports the need to care about better fulfilling the social role of higher education institutions in general and of blended education in particular. Computing programs are small these days and they value usually every student. The actual low enrollments and the social service criterion are contradictory in nature and therefore a solution that presents a reasonable compromise is needed. We hope that our experience helped our university to develop a better understanding and implementation of such a solution.

Turoff (2006) indicates the importance of another social issue: the current emphasis on treating the student as a customer. According to him, consumerism will force all those concerned with the quality and utility of a higher education to focus on the quality and effectiveness of the instructors. Hence the need to improve assessment of student learning and quality control in blended courses.

6. CONCLUSION

In our opinion, blended courses reflect partly the challenge to introduce the principles of flexible, lean manufacturing (anytime, anywhere, serving big and small customers) to universities when it comes to teaching non-traditional students. In our opinion, every potential student matters for the future of society. That is reinforced through the availability of technology supporting blended learning. It is necessary to implement processes and establish structures enabling faculty and academic management to become more active in the wider usage of technology in classes for day and non-traditional students that allow flexible course offerings through combining distance and day teaching methods. A substantial unexplored issue is to use this process for faculty development as suggested by Vaughan and Garrison (2006). The experiential reflections we provided in this paper hopefully help in developing a better understanding of some aspects of the methodology, technology, faculty and societal issues associated with blended learning following the framework suggested originally by Turoff (2006).

Possible future related work to improve the application of blended learning approaches in the information systems program at ECSU will involve assessment of student learning using direct methods involving projects rubrics (see Petkov et al. (2007)) applied to a blended learning environment. Another potential line of future work could be to compare the effectiveness of the two approaches and the models of blended learning discussed in Bershin (2004) and Alvarez (2005). This paper is a humble contribution to improving the understanding how to integrate daily work on continuous improvement of curriculum and teaching methods with the diffusion of best practices in assessment and use of educational

technology in serving a diverse student population through blended learning courses.

7. ACKNOWLEDGEMENTS

8. REFERENCES

Aggarwal, A. K. (2003). *Web-based education: learning from experience*. IGI Publishing, Hershey.

Alvarez, S. (2005). Blended learning solutions. In B. Hoffman (Ed.), *Encyclopedia of Educational Technology.* Retrieved October 5, 2007, from http://coe.sdsu.edu/eet/articles/blendedlearning/start.htm

Bershin, J. (2004). *The blended book of learning*. San Francisco: Pfeiffer

Choi H.Y. and Park, J-H. (2006). Difficulties that a novice online instructor faced A Case Study. *The Quarterly Review of Distance Education*, 7(3), 317–322

Conceicao, S.C.O. (2006). Faculty lived experiences in the online environment, *Adult Education Quarterly*, 57(1), 26-45

Gorgone,J.T., G.B., Davis, J.S.., H.Topi, D.L Fernstein, H.E. Longenecker, 2002, "IS' 2002: Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems", Database, Vol 34 No 1 2003.

Janicki, T., & Liegle, J. O. (2001). Development and evaluation of a framework for creating Web-based learning modules: a pedagogical and systems perspective. *Journal of Asynchronous Learning Networks*, 5(1), 58- 84.

Mayadas A. F. and Picciano, A. G. (2007). Blended learning and localities: the means and the end. *Journal of Asynchronous Learning Networks*, 11 (1).

Petkov, D. and Petkova, O. "Development of Scoring Rubrics for Projects as an Assessment Tool across an IS Program", *Journal on Issues in Informing Science and Information Technology (IISIT)*, Vol. 3, 2006, 499-509.

Petkov, D, Petkova, O., Jarmoszko A. and D'Onofrio, M. (2007) Using Scoring Rubrics for Assessment of Projects in Interrelated IS Courses, Accepted refereed paper for the IAIM Conference, Montreal, Dec. 2007.

Petkova, O., Jarmoszko, T.A., and D'Onofrio, M.J. (2006). "Management Information Systems (MIS) program assessment: Toward establishing a foundation", *Journal of Informatics Education Research (JIER)*, Vol.8, No2, Spring 2006.

Swan K. (2007) Research on Online Learning, *Journal of Asynchronous Learning Networks*, 11 (1).

Tallent-Runnels, M. K., Thomas, J., Lan, W., Cooper, S. Ahern, T. Shaw, S., & Liu X. (2006). Teaching courses online: A review of the research. *Review of Educational Research*, 76(1), 93- 135.

Turoff M. (2006), The changing role of faculty and online education, *Journal of Asynchronous Learning Networks*, 10 (4).

Vaughan, N. and Garrison, D R. (2006). How blended learning can support a faculty development community of inquiry, *Journal of Asynchronous Learning Networks*, 10 (4).