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Table of Contents – June 2010

Editorial

A Voice from History

Edward L. Thorndike, James D. Finn and Donald G. Perrin

Ninety eight years ago, Edward L. Thorndike shared these insights about the future of textbooks. Little did he know the extent to which technology would change global communications, teaching, and learning. To quote James D. Finn:

> "*Here are the insights of a genius. History can very often teach us a lesson in humility--and it does here. The interesting question is: why couldn't we see it then?*"

Finn draws attention to these insights from "Education" by Edward L. Thorndike:

> "**Guidance in habit-formation and reasoning**. Text-books often state what habits are to be formed without giving the reader exercises in forming them, but this is not a necessary feature of printed matter. Text-books on geography, history, spelling, English composition, grammar, economics, philosophy or sociology could, by the exercise of enough ingenuity, provide for the actual formation of habits in the way that books of examples to be done in arithmetic, or sentences to be translated in Latin, or experiments to be done in chemistry do.
>
> "Text-books still less often guide the pupil to think out conclusions himself so far as he can. They commonly give the results of reasoning and perhaps problems demanding reasoning, but they do not so manage the latter that the pupil is at each stage helped just enough to lead him to help himself as much as is economically possible. They do not, that is usually get the full value of the questioning, 'developing,' inductive, and experimental methods of teaching. Nor do they usually give work in deductive thinking so arranged as to stimulate the pupil to make and test inferences himself.
>
> "This fact is partly due to conventional customs. But there is also a real difficulty, due to the fact that pupils cannot be trusted to follow directions. Books could be written giving data, directions for experiments and problems with the data, and questions about the inferences. The student could be instructed to read each helping piece of information, suggestive question and the like only after he had spent a certain time in trying to do for himself what he was directed to do. Such books might be more effective than all but the best tenth of personal teaching, <u>if students would faithfully try as directed before reading ahead for the helps given.</u>
>
> But they will usually greedily use up all the helps first. If, by a miracle of mechanical ingenuity, a book could be so arranged that only to him who had done what was directed on page one would page two become visible, and so on, much that now requires personal instruction could be managed by print. Books to be given out in loose sheets, a page or so at a time, and books arranged so that the student only suffers if he misuses them, should be worked out in many subjects. Even under the limitation of the natural tendency of children to get results in the easiest way, a text-book can do much more than be on the one hand a mere statement of the results of

reasoning such as an ordinary geography or German grammar is, or on the other hand a mere statement of problems, such as the ordinary arithmetic or German reader is.

"From the point of view of interest in work, personal teaching is usually more sociable, but the difference between it and text-book teaching in this particular could be reduced by skill in organizing the latter.

"The evils of rote-memorizing or merely absorptive study on the part of pupils, and of lack of progress on the part of teachers, which are attributed to text-books, are not at all necessary consequences of their use. It is easy to make it more satisfying to pupils to understand than to memorize, and to think than merely to read. A lazy or stupid teacher will not be cured so well by being deprived of all text-book aids in teaching a subject as by being given a dozen such and required to show that he uses them all well.

"**The misuse of text-books.** Finally, many of the evils attributed to the overuse of textbooks are really due to misunderstanding and misuse of them. In the case of a good text-book there is a reason for every item and for its position in the whole. Too few teachers know the exact purpose of the text-books they use. Too often a teacher uses a section of a book much as a savage might use a coat to cover his legs; or as a child uses a saw to cut a string, scissors to cut a board, and a padlock as a bracelet.

"On the whole, the improvement of printed directions, statements of facts, exercise books and the like is as important as the improvement of the powers of teachers themselves to diagnose the condition of pupils and to guide their activities by personal means. Great economies are possible by printed aids, and personal comment and question should be saved to do what only it can do. A human being should not be wasted in doing what forty sheets of paper or two phonographs can do. Just because personal teaching is precious and can do what books and apparatus can not, it should be saved for its peculiar work. The best teacher uses books and appliances as well as his own insight, sympathy, and magnetism."

Ninety eight years later we have computers and learning management systems with diagnostic-prescriptive tools to construct custom learning experiences for each student from interactive multimedia learning objects. We have individualized educational programs where students learn different things at different rates according to their needs, experience, learning styles and interests. We have the benefits of a century of research, improved teacher training, and access to educational resources and technology. Teachers collaborate in the design and implementation of learning programs, interact with students, and provide tutoring and individual assistance as needed. Students also collaborate and learn from each other as they solve problems together and share their personal experiences

We also have schools that emulate the traditions of learning in the 19th and early twentieth century. And we continue to argue how to integrate the best features of the old and the new.

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1. James D. Finn and Donald G. Perrin. Teaching Machines and Programed Learning: A Survey of the Industry 1962. OE-34019. United States Government Printing Office, 1962.

2. Thorndike, Edward L. Education, New York: The Macmillan Company, 1912, pp. 164-167.

Editor's Note: This study is a model for effective collaboration, design and implementation of distance learning programs. It combines distinctly different racial and cultural student populations with faculty collaboration in design and team teaching. Participating teachers and students in their various communities show enthusiasm for the process and for the results: greater involvement and learning for the students, and for teachers, broadening of teaching and learning management using synchronous and asynchronous distance learning technologies.

Building Virtual Bridges with Online Teaching Partnerships

Julian Scheinbuks and Anthony A. Piña
USA

Abstract

This article provides a case study of a program to establish online teaching collaborations between three universities with distinct locales and different racial and cultural student populations. Faculty at the partner institutions engaged in collaborative instructional design and team-teaching to deliver instruction using both synchronous and asynchronous technologies. Students at rural suburban and inner-city universities learned how to be effective online learners as they interacted with each other in virtual classrooms and discussion forums. As a result of these partnerships, faculty became more comfortable using technologies to teach a diverse student population and new courses were added to the universities' curriculum.

Keywords: Distance Learning, Collaboration, Diversity, Team-Teaching, Partnerships

Introduction

One of the advantages of distance education is the ability for learning to occur unrestrained by the limitations of time, space and location. From the early days of print-based correspondence to the current era of interactive online instruction, distance education has been in the business of transcending boundaries (Simonson, Smaldino, Albright & Zvacek, 2008). Longstanding partnerships between international universities have demonstrated that distance education can be a helpful tool in breaking down barriers existing between different countries, races and cultures (Hodgkinson & Holland, 2002). However, one does not have to cross the ocean to find racial and cultural differences among faculty and students. Even within the same city, these differences can be encountered as one travels from one side of the city to another or from the city into the nearby suburb or country.

In this article, we summarize the results of a four-year project to transcend institutional and cultural boundaries by means of online teaching partnerships among faculty and students at three institutions with different localities and racially distinct populations. These partnerships entailed a combination of collaborative instructional design and teaching using synchronous and asynchronous instructional and communication technologies. Courses were co-developed and team-taught by faculty from the three partner institutions. Faculty members who were new to the online teaching environment collaborated with and were mentored by experienced online instructors. As a result, they became more adept at using technology in their teaching. Students from diverse backgrounds were able to participate in a learning environment in which they interacted with those of difference races, cultures and locales. Both faculty and students unfamiliar with distance education came to the realization that effective teaching and learning can occur outside the classroom. In the words of one of the teaching teams, "we learned most from each other".

Background

In 2002, the Illinois Board of Higher Education (IBHE) funded a collaborative effort between two public universities, the University of Illinois at Springfield (UIS) and Chicago State University (CSU), to promote the use of online learning to reach previously underserved student populations (IBHE, 2005). Chicago State University's online learning program was new, small and included many instructors with little experience teaching in an online environment. The online program at the University of Illinois was much larger and more established, with many courses and entire degree programs online (Oakley, 2004). The grant funded project allowed UIS to provide advisement, training and staff development activities to Chicago State University (McCurdy & Schroeder, 2005a).

Both institutions saw value in expanding the scope of the partnership. The Office of Distance Learning at Chicago State University had a goal to expand the quantity of its distance learning offerings and to develop online teaching expertise among its faculty. The Office of Technology-Enhanced Learning (now the Center for Online Learning, Research and Service) at UIS had a goal to extend the University's outreach beyond its borders to a more diverse student population (McCurdy & Schroeder, 2005b). In 2004, the original IBHE proposal was amended to include online teaching partnerships between CSU and UIS, allowing for online collaborations between individual faculty and students at the two universities. In 2005, the partnership was expanded to include Northeastern Illinois University, an urban campus with a larger and more diverse student population. Characteristics of the three universities involved in the online teaching partnership are shown in Table 1 below. The goals of the partnership were fourfold:

- Increase student exposure to technology.
- Train faculty to use technology to enhance face-to-face and blended courses.
- Enhance the curricula at the partner universities.
- Encourage and provide a rich learning experience to a diverse student population.

Table 1
Institutions participating in collaborations

Institution	Locale	Enrollment	Student Population
University of Illinois-Springfield	Rural	4,900	Predominately White
Chicago State University	Urban	7,200	Mostly African-American
Northeastern Illinois University	Suburban	12,000	Diverse with a significant Hispanic population

Nestled among the cornfields not far from the state capital in central Illinois, The University of Illinois at Springfield (UIS) is a small, rural campus with a predominantly white student population of nearly 5,000. Its online program, established in 1997, has been highly successful, with 17 fully online degree programs and an annual student enrollment growth of 30% (Schroeder & McCurdy, 2005). Retention of students in online courses at UIS is equivalent to that of students enrolled in face-to-face courses (Oakley, 2004). Training, development and technical support for online courses and faculty has been provided by the UIS Office of Technology-Enhanced Learning (OTEL). In 2007, the University was awarded the 2007 Sloan-C Award for Excellence in Institution-Wide Online Teaching & Learning (Sloan Consortium, 2009). In 2008 the Center for Online Learning, Research and Service and the New Century Learning Consortium were established to further the university's e-learning leadership and outreach goals to educational institutions across the country.

Chicago State University is an urban inner-city campus in the southern end of the country's third largest city, with the largest minority student population in the state. More than 80% of CSU's student population of 7,200 is African-American. When the partnership with UIS was established, CSU had a developing distance learning program that offered several online courses, but no online degrees. CSU's instructors were less experienced in teaching within a virtual environment than those at UIS. Training, development and technical support for online courses and faculty is provided by the CSU Office of Distance Learning (Scheinbuks & Piña, 2009).

Northeastern Illinois University (NEIU) is an urban public campus on Chicago's north side with a student population of approximately 12,000 (about the same as UIS and CSU combined). NEIU is recognized by US News and World Report as the most racially and culturally diverse campus in the Midwestern United States, with a population that is 26% Hispanic, 13% African-American and 11% Asian (U.S. News, 2005). Unlike UIS and CSU, NEIU had no dedicated distance learning department and offered no fully online courses or online degree programs when it joined the partnership. Training, development and support services for faculty participating in the OTP were provided by NEIU's Center for Teaching and Learning (Piña & Scheinbuks, 2007).

Infrastructure and Support

The nature of the OTP involved the establishment of mentor-mentee relationships in planning and implementing the instructional partnership. The faculty partners did not always assume exclusive roles of mentee and mentor, but shared these roles as they exposed each other to their strengths and weaknesses (Gatliff & Wendel, 1998). Those with more confidence in using technology in their teaching or great experience teaching online served as mentors for the other faculty members. However, sometimes the professors with less technology or online experience were the primary subject matter experts and served as content mentors for their peers. This cross-mentoring dynamic was particularly effective for partnerships whose courses spanned across different disciplines.

A faculty partnership was established when the partners agreed to the extent of collaboration (full semester or unique units). The partners cooperated to develop a syllabus containing assignments meeting the individual course objectives and the goals of the partnership. These were supported by an agreement to team teach and facilitate student activities and research in both synchronous and asynchronous modes. Students enrolled at their own university, so that there were no conflicts related to tuition and participation in programs leading toward a degree or certification. The instructors assigned by that institution were responsible for evaluating their own students' efforts (Scheinbuks & Piña, in press). Faculty participating in the online teaching partnerships were eligible to receive a stipend, which varied according to the length and extensiveness of the collaboration.

The project was made publically available on the UIS-sponsored Online Teaching Partnership website, where faculty members at the member universities made contact and provided information about the disciplines in which they taught and their specific topic areas of interest. Once faculty members had contacted each other and determined that they wished to collaborate, they notified the support office at their respective institutions to prepare a proposal for an online teaching partnership.

The Office of Distance Learning at CSU, the Office of Technology Enhanced Learning at UIS and the Center for Teaching and Learning at NEIU provided primary instructional and technical support for members of the partnership. This support included assisting faculty in the development of proposals, training in the use of technology, administering the learning management systems and virtual classrooms, dissemination of information, preparing reports and troubleshooting.

Technologies

Some of the participating faculty had prior experience teaching online or in using technology within their face-to-face courses, while others had little or no experience and required training and mentoring. The learning management system (LMS) used by all three institutions for asynchronous, instruction, communication and interaction, was Blackboard's Enterprise Edition, version 7 (Blackboard, 2009). The most common LMS tools used within the partnerships were uploading course content, class announcements, threaded discussion forums, assignment management, quizzes and assessments, and the online grade book (Piña, 2010).

Synchronous tools for delivering interactive real-time instruction, such as two-way audio, application and desktop sharing, whiteboards, live PowerPoint presentations and interactive polling and quizzing, were provided for by the Elluminate Live classroom system (Elluminate, 2009). These technologies were made available to both faculty and students, to assist in developing and completing joint assignments and discussions by the support organizations at each institution.

Since administrative and management rights and authority for the Blackboard and Elluminate systems resided at the same departments that provided the primary support for the online teaching partnerships, each partnership could be assigned to a joint Blackboard course, administered by one of the campuses. Students and partner faculty from both campuses were enrolled into the joint course. Both faculty members were given full instructor privileges in the course. Some instructors chose to use the group feature in Blackboard to separate students from the two institutions for grading purposes, but all of the courses used tools in Blackboard to allow all of the students to interact with each other and/or complete joint assignments (Piña & Scheinbuks, 2007).

Collaborations

The faculty and students participating in the collaborations were of diverse ethnic, racial, socio-economic, educational, and technological backgrounds. The demographics of the students tended to reflect those of the geographic area in which their institution was located. UIS students tended to be white, middle-class and rural. CSU students tended to be heavily African-American and from Chicago's south side. NEIU students tended to be more racially mixed, with about 40% of Latino ancestry. It was expected that this mix of diverse backgrounds would enhance teaching and learning for all the collaborative groups studied (Scheinbuks & Piña, 2009). Nine teaching collaborations that were implemented and completed during the initial four years of the online teaching partnership are shown in Table 2 below (Scheinbuks & Piña, 2010). Each of the collaborations consisted of two faculty members, each from a different university.

Table 2
Institutions and courses involved in collaborations

	Institution	Course	Institution	Course
1	U. of Illinois-Springfield	Technology in the Curriculum	Chicago State U.	Cooperative Education
2	U. of Illinois-Springfield	Internet and American Life	Chicago State U.	Special topics in Technology & Education
3	Chicago State U.	Creative Writing	U. of Illinois-Springfield	Black Women Authors
4	Northeastern Illinois U.	Technology for School Leaders	Chicago State U.	Cougar Academy for Future Teachers
5	U. of Illinois-	Science Teaching	Northeastern	Environmental Studies

	Springfield	Methods	Illinois U.	
6	Northeastern Illinois U.	Human Resource Development	Chicago State U.	Educational Leadership and Technology
7	Chicago State U.	Educational Leadership	U. of Illinois-Springfield	Educational Leadership
8	Northeastern Illinois U.	Public Administration (Studies of Barrio)	U. of Illinois-Springfield	Latino & Latin American Studies
9	Chicago State U.	Introductory Biology Health	U. of Illinois-Springfield	Second Life

#1 Technology in the Curriculum and Cooperative Education

This collaboration between two professors from different departments within their respective colleges of education provided an opportunity for both faculty members to develop a unique assignment unit for all members of the collaborative class. The class consisted of students who had varying experiences, backgrounds, and cultural differences. Students from CSU were pre-service education majors and the students from UIS were in-service educators. They were divided into several research groups, which included students from both UIS and CSU. Group discussions were facilitated in real-time by the use of Elluminate.

Due to the differences in student service background, the concerns of CSU students were different than those of the UIS students. The groups worked well together in a professional manner and successfully carried out a series of surveys concerning technologically advanced high schools in three areas: Northern Illinois, Central Illinois, and the Greater Chicago area. The extent of the study was novel for this class and had an impact on reaching class objectives for the course. The students learned to effectively use the Elluminate tool in working well together by complementing each other's skills and interests. In conclusion, the students felt that the collaboration between the classes was a rewarding experience that enhanced learning.

#2 Internet and American Life and Special Topics

This collaboration allowed a UIS professor of communications to mentor another in online pedagogy as their students collaborated in an online course environment. CSU students and a CSU instructor were enrolled within a UIS Blackboard course shell. Activities were also shared by using the Elluminate software. The faculty agreed to a common syllabus with similar expectations for both UIS and CSU students. Readings of the *Pew Charitable Trust Project* served as the basis for student discussion of their own experiences. In describing the tone of the class, one of the instructors (UIS) noted, "The perspectives reflected in the discussions were far more rich with the addition of the CSU students. Extended exchanges were common as the students sorted through the impact of the Internet on such aspects of American life as health care, government, elections, and education" (Schroeder & McCurdy, 2005).

The collaborating CSU faculty member provided a different but relevant perspective. As time progressed, he developed experience and confidence in the role of an online collaborative faculty member and began to recognize some significant differences in the computer literacy and online course expectations between CSU and UIS students. Other CSU online faculty confirmed these observations. The CSU faculty member adapted this UIS course to offer it as a new CSU course, thus expanding the CSU curriculum.

#3 Creative Writing and Black Women Authors

This collaboration gave a unique opportunity for both faculty members who were interested in 'Black Women Authors' to create a unit for discussion between their two classes. In preparation

for this unit, both classes were assigned to read *Mama Day*, by Gloria Naylor and view the film, *Julie Dash's Daughter of the Dust*. Real-time collaboration and discussion occurred in two sessions using Elluminate Live Classroom. The software permitted considerable input from most members of both classes. In addition, there were several sidebar conversations (implemented by written chat that related to the ongoing speaker's discussion). Students reported that they had enjoyed the collaborative sessions and felt that it helped them understand the issues and relative to the novel, Mama Day. Both instructors were excited about the results of the collaborations and indicated that they would be willing to collaborate again.

#4 Technology for Prospective Teachers and School Leaders

In this collaboration, one of the instructors, an administrator and faculty member in instructional technology, was able to mentor the other, a young teacher education instructor, concerning the implementation of pedagogical techniques used with technology. The two faculty members had agreed to a blended learning approach where a component of the collaboration was asynchronous using Blackboard for online discussions between students in the two courses and synchronous lessons, and where the instructors provided live step-by-step instruction in the creation of instructional materials using PowerPoint software in both linear and non-linear formats. In implementing the synchronous presentations and exercises, the presence of faculty members to assist students was an important issue in providing a successful student experience.

A breakdown in communication occurred as a result of instructional assignment changes at Chicago State University. As a result, the class of pre-service teachers at CSU was replaced by a class of pre-college students who were interested in entering a career in education—unbeknownst to the NEIU instructor. The students at NEIU were graduate students who were principally professional educators in the last stages of their master's degrees. As a result of the gap in communication, some miscalculation occurred in developing collaborative assignments that would be equally useful and beneficial to both classes. In reality, both classes had a very unique experience in understanding the differences in the capabilities and maturities of the collaborative class. The collaboration was also a challenging experience for both instructors who had to do some "on the fly" adaptation of their instruction to match the backgrounds of the students in each of the classes. The pre-college students tended to be a bit overwhelmed, while the graduate level students were amused and understanding of their younger colleagues located on the other side of the city.

#5 Environmental Studies and Science Teaching Methods

Both classes in related disciplines provided an opportunity for the faculty members to focus on various points of views related to the collaboration. The CSU class had a greater focus on the development of instructional techniques related to the various scientific disciplines, particularly environmental sciences. The NEIU class provided students at that institution with an opportunity to fulfill their general education requirements for an undergraduate degree by being exposed to real environmental issues and understanding how these can be studied to resolve environmental problems. The instructors agreed upon a syllabus that provided an opportunity to collaborate and team-teach their students for three different units or areas.

The first area was related to the development of concept maps as an approach to relating scientific concepts. Various biological concepts were studied and concept maps were developed relative to the regulation of the biosphere through a process called homeostasis. Life forms interact with environmental factors to produce a self-regulating system. A movie clip was used to illustrate the concept. A classroom activity was designed in which an interactive free computer program CTOOLS was used for producing the concept maps. Students from both classes evaluated each other's maps in terms of the overall effectiveness of organizing new information. The CSU class

in terms of how the use of these maps could enhance learning in a high school classroom setting analyzed the learning process.

The second unit involved a class visit to the Green Technology Center in Chicago. This city-operated center provides information about how to pursue and develop green technologies. This outing permitted students in both classes to meet and interact. Up to this point, the students interacted asynchronously. This outing made it possible for the students to meet their counterparts in the teaching partnership and interact on a different level. Many of the students in the environmental studies class have considered developing a career in education. This interaction was helpful for them to meet potential role models of students who were actively pursuing these objectives.

The third unit developed from concepts that had been discussed in the second unit. The second unit related to green technologies and the absence of hazards, while the third unit dealt with an understanding of hazards and how they affect the environment. Discussions of how hazards affect the environment were done synchronously using Elluminate. The NEIU instructor demonstrated an Air Emissions Modeling Program (ALOHA) to assist responders to emergency events. An understanding was developed of the issues related to such an environmental catastrophe. Students were then given similar problems for analysis and to develop strategic approaches for resolving these problems. As a result of the immersion into this model, each class developed different take-home lessons. The CSU students used this as a model to develop an instruction plan while the NEIU students used this as a model for understanding issues related to toxic accidents.

The students were queried about each of the three units. Their responses were positive and helpful in assessing learning associated with each of the units. Students were enthusiastic about the collaboration and said that they would participate in additional courses using similar formats. The two instructors were not experienced at using online technologies for instructor prior to the course and while they found some of the technology to be challenging initially, they were able to master a wide range of synchronous and asynchronous applications.

#6 Human Resource Development and Educational Leadership

This was an instance where a teaching partnership had been planned, but one of the instructors' courses did not have sufficient enrollments to be offered that semester. In its place, another course was selected after the semester had begun. The original full-semester partnership was modified to four weeks of collaborative instruction.

This partnership provided two faculty members the opportunity to collaborate in teaching two different courses, one offered by Departments of Human Resource Development at NEIU and the other by the Department of Educational Leadership at CSU. Students in the NEIU were undergraduates who were interested in training and development in business and industry settings, while the CSU students were studying the integration of technology into school curriculum and instruction. Both courses were blended courses, which implemented both asynchronous activities using Blackboard and synchronous sessions using Elluminate. This teaching partnership involved a number of collaborative events: 1) a discussion forum related to interviews with technology coordinators at local K-12 school districts by the CSU class. Both classes discussed the results of several research findings and proposed an optimal type of arrangement for a local K-12 institution. The students discovered that some of these institutions were lacking in technology (implicating a digital divide) while others were well supported. Students compared and contrasted K-12 technology training and support with that provided in industry settings.

A second asynchronous unit dealt with the advantages and disadvantages of online verses blended learning modalities. The discussions indicated that both are appropriate, but the blended class

would be the most acceptable to the group. They discussed what types of learning should take place in synchronous verses asynchronous sessions. A further discussion related to recent research on the use of mobile technology, such as iPods, PDAs, MP3 players and cell phones by minority students and Caucasian students. The finding that minority students tended to use the advanced features of mobile technology at higher rates than Caucasian students led students from both courses to conclude that mobile delivery of online content should be a priority of minority-serving institutions (Rainie & Keeter, 2006; Rainie & Madden, 2005).

A synchronous presentation of the history of distance learning in the state of Illinois was presented using Elluminate followed by a discussion of the presentation using the tools made available by Elluminate. At the conclusion of the course, both of the instructors and the students concluded that, despite the rocky start of the partnership, it was a success and the instructors were looking forward to future collaborations with each other.

#7 Educational Leadership

This partnership gave the two faculty members an occasion to collaborate in teaching two educational leadership classes at the graduate level located at different institutions separated at a distance. The UIS class was populated with graduate-level in-service teachers and the CSU class contained undergraduate-level pre-service teachers. The instructors were experienced in offering both blended course and online course modalities. The instructor at UIS had stronger technology skills than the instructor at CSU. The instructors developed a syllabus for each of their respective classes that had designated both asynchronous activities (2-3 weeks) and synchronous activities (3 weeks). The asynchronous activities were implemented easily and the students appeared to enjoy the interactions between members of both classes. Two of the three synchronous sessions using Elluminate were successfully implemented. The instructors interacted well in planning the collaboration as well as interacting well in the various collaborative sessions with the students.

All instructors were responsible for setting the standards and objectives for their respective classes and evaluating their own students. Although the objectives for the two respective courses differed somewhat, the instructors agreed upon the objectives for the collaborative sessions. Students were queried both at midterm and at the end of the course by survey to obtain feedback concerning the collaboration. The students indicated that they enjoyed the collaborative activities and felt that the collaboration added an extra dimension to the content of the course. The extra dimension was related to student backgrounds—UIS is an institution located in rural Illinois while CSU is located in the Chicago urban area. Both students and faculty felt that their experiences were valuable in that they were able to obtain unique information and understanding relative to their diverse backgrounds. Both faculty members have presented papers at conferences based upon this collaborative experience.

#8 Latino and Latin American Studies

A proposal for a semester-long partnership focusing on diversity (the Barrio in Latin-American communities) was submitted during the spring semester. During this semester, the faculty team planned the format for course collaboration to be implemented during the fall semester. Since a course on this topic did not exist at UIS, the faculty member proposed a new course that met UIS general education requirements so that it could be scheduled for the fall semester.

The partnership focused initially on the development of web resources to study the Barrio. To accomplish this goal, an introduction to the use of technology to link the classes together was provided within the first two weeks. During the third week, a lecture/discussion was presented to both classes on "The Meaning of Context" relative to the study of the Barrio. The demographics of Chicago and the state of Illinois were examined in lecture/discussion using Elluminate. Students were involved in Blackboard forums related to the nature of the Barrio. Following these discussion, students were assigned to select and develop research projects based upon the

course's introductory sessions. These research projects were discussed during the fifth week of the partnership.

After the initial two week technology introduction period was complete and the team-teaching of the course content commenced, it became clear to the two faculty partners that their teaching styles were not compatible. One instructor was very meticulous in his preparation and delivery and preferred instructor-led discussions, while the other one preferred to "go with the flow" and allow the instruction and discussion to be led by the students. Ultimately, these two styles proved to be incompatible and it was agreed that the collaboration would end after 5 weeks and the two courses would be developed and offered independently for the remainder of the semester. Feedback from the students indicated that they were unaware of the difficulties between their two professors and assumed that the course was designed for collaboration at the beginning only. Students from both courses rated them highly, which reflected positively on the professionalism of the faculty involved.

#9 Introductory Biology Health

This collaboration provided an opportunity to enhance an introductory level biology class focused on issues related to sexually transmitted diseases. The objectives of the course are to make the issues of contracting and treating these diseases meaningful to the minority student audience at CSU. Collaboration was begun between CSU and UIS, in partnership with the Illinois Department of Public Health's Brothers and Sisters United Against HIV/AIDS (Illinois Dept. of Public Health, 2009), to enhance learning by immersing the students in the course into the virtual worlds of Second Life. Some students in the class were familiar with Second Life and had developed avatars while others accessed it for the first time to develop their new avatars. With the assistance of UIS Office of Technology Enhanced Learning, our students were introduced to the virtual instructional world of UIS Second Life Island. The process of enrolling students into Second Life was cumbersome because of issues related to the selection of avatar names.

Students in the class were given access to the BASUAH Ambassador training site to learn and review basic information about sexual diseases. The course also provided a unique focus promoting the attitude of education for the public about problems surrounding these diseases. Many of the students were excited about the opportunity to become BASUAH ambassadors and looked forward to educating their community within the confines of community and state organizations. The class utilized this experience to develop skits so that they could role play how they would meet the challenges of educating members of the community about sexual disease issues. The presentations and skits were recorded on Elluminate and then converted to a format so that these could become available in the BASUAH instructional area within the UIS SL Island. Support for the collaboration will be provided through a newly established consortium, the New Century Learning Consortium that both institutions have joined (New Century Learning Consortium, 2009).

Results

To gauge the impact of the online teaching partnerships, interviews were conducted with the collaborating faculty, support personnel and a sample of students enrolled in the courses. Student comments from Blackboard discussion forum questions and end-of-course evaluations were also analyzed. Faculty who participated in the online teaching partnerships were in agreement that it promoted a well-rounded education that provided access to a diverse student population. It also afforded opportunities for faculty to enhance and develop teaching skills by learning how to apply new technologies and how to teach in asynchronous and synchronous online learning environments. Although most of the participating faculty had some experience with Blackboard, only four had ever used Elluminate. At the end of their collaborative experience, all of the instructors expressed confidence in teaching using either a learning management system or a

synchronous virtual classroom. They praised both Blackboard and Elluminate for having a relatively gentle learning curve and for having few technical glitches. Faculty rated the experience of collaborating and team teaching as exhilarating and motivating, with the caveat that the collaborators must be compatible in their goals and teaching styles.

One of the greatest advantages indicated by the faculty was that online technologies can be used successfully to bring together and teach students who are racially and culturally diverse and that the interactions between students at the different institutions enhanced the courses. They also considered the new courses that were developed as a result of the project to be a very tangible success. All of the faculty participants—including those in the least successful partnership—stated that they would be agreeable to participating in future collaborations of this kind and that there was great potential for a state-wide initiative with more participating institutions.

Students likewise held positive views of the online teaching partnerships, mirroring the faculty comments about the utility of both Blackboard and Elluminate. They commented that the technology enhanced their learning experience. They particularly enjoyed the ability to access materials at any time, view their grades, upload their homework, interact with and query their instructors, and interact with other students. This agrees with findings by Educause on how students utilize and value LMS features (Kvavnik & Caruso, 2005). Although students praised the ability to interact and work with students at the partner institutions and that they would like to do more inter-institutional collaboration, they did not tend to acknowledge that they were interacting with students of different races, backgrounds or rural versus urban locale. This was taken as a positive indicator that an online teaching partnership can bring diverse students populations together successfully.

The directors of the support centers at the three institutions were also pleased with the positive results of the project and its impact upon the participating faculty and students. They also discussed some of the challenges involved in establishing and implementing the online teaching partnerships. These included funding delays from the IBHE, difficulty in publicizing the program to faculty, scheduling conflicts, changes in teaching assignments, and low enrollments in a few of the courses that prevented some collaborations from taking place. However, they acknowledged that the increase in technological competency of the faculty, the positive reviews of the students and the enhancements to curriculum more than made up for the difficulties that were experienced.

Conclusion

Although the initial online teaching partnership project has concluded, a number of activities have grown out of it. The participating faculty members continue to use synchronous and asynchronous technologies in their online, blended and web-enhanced courses. Several of the participants have delivered papers and presentations at local and national conferences based upon their experiences with their collaborations. Both instructional and non-instructional collaborations between the three partner institutions and others in the region are being facilitated by means of SLATE, a community of practice of leaders and faculty from over 60 institutions who share an interest in technology and distance learning (Piña, Sadowski, Scheidenhelm & Heydenburg, 2008). The New Century Learning Consortium (2009) has been established with funding by the Alfred P. Sloan Foundation to take the basic premises of the online teaching partnerships to colleges and universities across the United States and beyond. Online teaching partnerships can be a viable and effective way to build virtual bridges across races, cultures and institutions.

References

Blackboard (2009). *Blackboard learn*. Retrieved November 1, 2009 from http://www.blackboard.com.

Elluminate (2009). *Elluminate live!* Retrieved November 1, 2009 from http://www.elluminate.com.

Gatliff, B. & Wendel, F. C. (1998). Inter-institutional collaboration and team teaching, *American Journal of Distance Education 12* (1).

Hodgkinson, M & Holland, J. (2002). Collaborating on the development of technology enabled distance learning: A case study. *Innovations in Education & Teaching International 39*(2).

Illinois Dept. of Public Health (2009). Brothers and sisters united against HIV/AIDS. Retrieved November 30, 2009 at http://www.basuah.org/.

IBHE (2005). *State of Illinois board of education: Higher education cooperation act, fiscal year 2005 application*. Springfield, IL: State of Illinois Board of Higher Education.

Kvavnik, R. & Caruso, J. (2005), *ECAR study of students and technology 2005: Convenience, connection, control and learning*. EDUCAUSE Center for Applied Research, Boulder, Co.

McCurdy, S. & Schroeder, R. (2005a, June). *Achieving diversity through online inter-institutional collaborations.* Paper presented at ED-Media World Conference on Educational Multimedia, Hypermedia and Telecommunications, Association for the Advancement of Computing in Education, Montreal, Quebec, Canada.

McCurdy, S. & Schroeder, R. (2005b, August). *Inter-institutional collaboration in the delivery of online learning.* Paper presented at the annual Distance Teaching and Learning Conference, Madison, WI.

New Century Learning Consortium (NCLC) (2009). Retrieved May 4, 2009 from http://nclc-online.ning.com.

Oakley, B. (2004). The value of online learning: Perspectives from the University of Illinois at Springfield. In J. C. Moore (Ed.), *Elements of quality online education: Into the mainstream*. Needham, MA: Sloan Consortium.

Piña, A. A. (2010). An overview of learning management systems. In Y. Kats (Ed.) *Learning Management Systems Technologies and Software Solutions for Online Teaching: Tools and Applications*. Hershey, PA: IGI Global.

Piña, A. A., Sadowski, K. P, Scheidenhelm, C. L. & Heydenburg, P.R. (2008). SLATE: A community of practice for supporting learning and technology in education. *International Journal of Instructional Technology and Distance Learning 5*(7).

Piña, A. A. & Scheinbuks, J. (2007, October). *Creating a culture of technology through inter-institutional online teaching partnerships.* Paper presented at the Association for Educational Communications & Technology, Anaheim, CA.

Rainie, L. & Madden, M. (2005). *Podcasting catches on*. Washington, DC: Pew Research Center

Rainie, L. & Keeter, S. (2006). *How Americans use their cell phones*, Washington, DC: The Pew Research Center,

Scheinbuks, J. & Piña, A.A. (2009, March). *An e-learning instructional partnership between culturally diverse minority institutions*. Paper presented at the Technology in Education (TechEd) Conference, Ontario, CA.

Scheinbuks, J. & Piña, A. A. (2010). Online teaching partnerships in diverse socio-economic institutions. In S. Mukerji & P. Tripathi (Eds.) *Cases on Technological Adaptability and Transnational Learning: Issues and Challenges*. Hershey, PA: IGI Global.

Schroeder, R. & McCurdy, S. (2005). *Inter-institutional class collaborations online*. Paper presented at the Midwest EDUCAUSE Conference, Chicago, IL.

Simonson, M., Smaldino, S., Albright, M. J., and Zvacek, S. (Eds.) (2008). *Teaching and learning at a distance: Foundations of distance education* (4th ed.). Upper Saddle River, NJ: Prentice Hall.

Sloan Consortium (2009). 2007 Sloan-C excellence in online teaching and learning awards. Retrieved May 12, 2009 from http://www.sloan-c.org/aboutus/awards.asp.

U.S. News & World Report (2005). Choosing a school: Campus diversity. *America's Best Colleges*. New Hudson, MI: U.S. News & World Report.

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Editor's Note: Increasing availability of broadband web connections is leading to increased use of video such as YouTube, Skype, and a wide variety of video-conferencing systems. Commercial systems include GoToMeeting, while educators are using software such as Wimba and Video Connect. Although these systems were initially designed for group instruction, they are valuable tools for recruiting, interviews, tutoring, counseling, and team planning.

Using Web Conferencing and the Socratic Method to Facilitate Distance Learning

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USA

Abstract

The Socratic Method of teaching encourages instructors to engage students in dialogue which challenges students to participate in active learning. The goal of this teaching method is to encourage student efforts to become critical thinkers and problem solvers. The Socratic method of teaching is often promoted in the traditional college classroom but distance education instructors may find it challenging to institute in an online environment. This paper evaluates the effectiveness of using web conferencing technology such as the Adobe Connect meeting platform to support the Socratic Method of teaching in an online environment. A pilot group of students who were unsuccessful in passing a business assessment in an online, asynchronous environment were given the opportunity to participate in a series of web conferences. The students were interviewed after their participation in the synchronous sessions to gather their opinion on the effectiveness of the sessions in helping them gain understanding of the concepts presented.

Keywords: Socratic Method, distance learning, teaching methods, web conferencing, active learning, online education, online classroom, business management

Introduction

Teaching methods in higher education often emphasize active learning in an effort to create meaningful experiences that can be transcended beyond the classroom. Business schools often rely on the case study approach in an effort to prepare students for the work environment. Research has demonstrated that the case study approach allows students to apply their classroom learning to their work environment (Hargreaves, 2008; Kunselman & Johnson, 2004). Collaborating with, debating and even challenging classmates can lead to a lively discussion in the classroom and lends itself well to the traditional, in seat classroom experience. Encouraging this same type of active learning in the online classroom can be challenging. Over 80% of higher education institutions offering online courses expect an increase in the number of online enrollments for the foreseeable future (Allen & Seaman, 2008). This paper presents a case study that examines how web conferencing was used to facilitate active learning of undergraduate students on business management topics. The case study was conducted at a medium size (approximately 13,000 students) online institution. The authors review the success of employing the Socratic Method of teaching with technology (namely Adobe Connect) to promote active learning in the online classroom.

Background

In the spring of 2009, college of business administrators identified a continuing problem with the pass rates for the business management objective assessment. The multiple choice exam, the final assessment in the business management major, covered content in organizational behavior, innovation and change, decision making, quality management, strategic management, and

operations management. The course was self-directed and allowed students to progress through the course material at their own pace. The course material consisted of five text books, a detailed syllabus which outlined the suggested course of study and practice assignments. Once the student felt they had gained the competencies required to pass the exam, the student scheduled the exam. The exam was pass/fail based on a pre-determined cut off score statistically calculated by the University's assessment department. A passing score on the exam indicated the student demonstrated competency in these topics. Study material was made available through a series of self-paced modules, practice exams and via an online community for students which was facilitated by a subject matter expert on the topics covered on this exam. A regular analysis of exam pass rates revealed extremely low rates as compared to other exams with similar levels of difficulty and with similar learning resources available to prepare students for the exam. The inability to pass the assessment was delaying graduation for a number of students who had attempted the exam several times with little success.

In order to identify issues with student success, the first step in the process was to analyze section scores for the objective assessment and to develop a list of learning objectives that seemed to be problematic for students. Faculty members supporting students in preparing for this assessment as well as students who had attempted the exam several times were surveyed and asked to list concepts or learning objectives they found most problematic on this exam.

The data gathered from research into the cause of poor pass rates indicated three distinct hurdles for students. First, the sheer volume of content covered on the objective assessment was excessive. The learning objectives for this exam corresponded to four distinct courses in a traditional undergraduate business program. Second, the more complex concepts were difficult for students to master in a self-directed learning environment. Students also indicated that isolation contributed to the difficulty in mastering the concepts. The distance learning process is often associated with isolation and alienation as the social interactions which are present for traditional students are often lacking in online courses (Chou, 1994; Healy 2009). Third, many students lacked real life experience with the concepts being studied making it difficult for them to place the theories into a meaningful context.

The college of business administrators developed a plan for addressing the hurdles faced by students. The first hurdle, the breadth of material on the assessment, was addressed by developing a plan for splitting the exam into two separate assessments which would allow students to focus on specific topics rather than a range of topics. Due to the complexities of changing the assessment, this change took several months to implement. The second and third hurdles were addressed by planning synchronous web conferences to provide opportunities for students to interact around a set of pre-determined questions. The faculty members supporting the synchronous workshops designed a set of examples for each of the concepts to provide for student discussion.

Adobe Connect was selected as the web conferencing software for the workshops. Adobe Connect was selected as it was a tool that was readily available within the university's computer resources and faculty had some limited experience using the tool for faculty meetings and training sessions. Adobe Connect would allow student-to-student interaction as well as student-faculty interaction.

This case study examines the effectiveness of using web conferencing as a method for supporting the Socratic Method. The research questions examined include:

1. Was Adobe Acrobat Connect an effective medium to aid the facilitators in providing adequate support for learners using the Socratic Method?

2. Did students perceive they gained a better understanding of the material after attending the Adobe Acrobat Connect seminars?

The Socratic Method

The Socratic Method of teaching involves asking questions in an effort to challenge common assumptions, beliefs and ideas (Pang, 2008). The Socratic Method is often used to promote critical thinking skills in students of all ages. The idea is to create an inclusive classroom environment where students feel comfortable debating and participating in dialogue in order to discover a greater understanding of the material presented in the class. The traditional classroom, where students and instructors are in a face to face environment, lends itself well to the Socratic Method. The instructor can break the class into teams and have them prepare and present their ideas on various concepts. Mock trials, case studies, scenarios and debates are used to promote critical examination of specific topics in an in seat college class. Employing these same teaching methods in an online environment presents many challenges. Can instructors facilitate critical thinking and complex arguments in an online environment?

The Socratic Method, by its very nature, places the instructor in a subordinate role versus a leader role (Maxwell, 2009). The instructor employing this method of teaching starts by asking questions in an effort to elicit responses from students and then follows up on the student responses with additional questions. The idea is that by participating in the active sharing of dialogue, students can develop and refine their critical thinking and problem solving skills. Technology can assist the instructor in successfully implementing this model in an online environment.

Method

Several technologies exist to assist the college instructor in facilitating interactive classroom learning. The web conferencing software, Adobe Acrobat Connect, is one method which allows real-time interactive meetings or seminars and was the software utilized in this case study. Web and video conferencing are becoming popular methods of supporting learning in online higher education (Reushle & Loch, 2008). Adobe Connect was chosen for this trial because it is web based, supports multi-media presentations, and students can connect using a web browser and Adobe Flash Player Runtime which most students already have installed on their personal computers. Adobe Connect also supports both video and audio conferencing tools and has a chat function.

E-mail invitations to the sessions were sent to 41 at-risk students. The at-risk students were identified by analyzing previous scores on the business management objective assessment. Of the 41 students identified as at-risk, 18 students were considered high risk having failed the business management objective assessment multiple times. Students who had been unsuccessful in passing the assessment in the previous six months were contacted via email and telephone by the lead faculty member and invited to participate in the Adobe Connect sessions. The students' academic advisors were also contacted and asked to encourage students to attend. The students and advisors were told that the facilitator would be reviewing the concepts that students often find difficult on the exam. As the course is asynchronous and self-paced, the synchronous chat sessions were not required but those struggling with the concepts were strongly encouraged to attend as many were facing financial aid suspension due to poor performance.

One week prior to each session, reading material on the concept to be discussed was forwarded to students via an e-mail attachment. General announcements concerning the sessions were posted prior to each session in the student learning community. An open invitation was issued to

business management students who would like to attend the sessions. The lead faculty member developed a PowerPoint presentation with a series of questions to get the discussions started.

Eight, 90-minute synchronous sessions were scheduled in the evenings to accommodate students in multiple time zones. Each of the eight sessions had a specific agenda covering specific topics covered on the exam. The topics to be covered in each session were made available to the students at least one week in advance via email and posted as an announcement in the course community. All sessions were archived immediately after the live session and were housed for three months in the course community. Students could view and download the archived sessions at any time after the conclusion of the live session. Two faculty members acted as facilitators. The dean observed the sessions and provided coaching and feedback to improve student support. Both facilitators were on camera during the sessions and shared control of the desktop being viewed by students. Students logged into the web conference to view the PowerPoint presentation and were able to interact via the instant messaging feature in Adobe Connect. The audio portion of the conference was conducted using a phone conferencing bridge. Table 1 represents the sessions offered and the numbers of students in attendance.

Table 1

Session Titles and Attendance

Session Title	Students in Attendance
Supply Chain Management	4
Innovation & Change Management	2
Decision Making Skills	7
Strategic Management Skills	10
Business Level Strategies, Organizational Culture & Structure	6
Organizational Behavior Skills: Diversity and Conflict Management	6
Quality Management Concepts	4
Operations Management: Control Charts	6

Ground rules were established at the beginning of each web conferencing session. The rules were reviewed by the facilitator at the beginning of the session. These rules were reviewed at the beginning of every session as new students participated in each session. Table 2 presents the group rules for the sessions.

Lessons Learned from Adobe Acrobat Connect Sessions

During the Adobe Acrobat Connect Sessions, the two workshop facilitators and the dean gathered data on what worked, what did not work and how to construct sessions that were more effective for students. Student feedback was solicited in the form of student interviews. The interviews were conducted by one of the session facilitators. Students were asked to respond to 16 questions about their experiences with the Adobe Connect sessions (see Table 3). Six of the questions addressed the technical aspects of workshop delivery including using Adobe Connect web conferencing and phone conferencing.

Table 2
Ground rules for the Adobe Acrobat Connect Sessions

Rule #1	No criticism of anyone's answers, even if the answers are incorrect
Rule #2	Mutual respect by and for everyone in the workshop
Rule #3	Communicate in the clearest way possible
Rule #4	Provide the most accurate and comprehensive answer to the question possible
Rule #5	Genuinely try to be understood by others

Table 3
Student Interview Questions

What action did you find most affirming during the discussion?
What confused you most about the session
What surprised you the most about the session?
How many of the eight sessions did you attend? If less than eight sessions, why did you miss the sessions?
Was the scheduled days and times for the sessions convenient for you? If not, what days and times would work better
Did you experience any technical issues with accessing the phone conference or the Adobe Connect sessions?
Did you have any problems viewing the PowerPoint slides for the sessions?
Do you have suggestions of ways that we can improve the technical aspects of the sessions?
Did the reading material or learning resources provided prior to the workshop help you gain understanding of the topic?
Were the objectives of the discussion clear?
Was the class organized in a way that facilitated you understanding the material?
Did you find the polls helpful?
Do you feel that you have a better mastery of the competencies at the end of the discussion?
Which sessions did you find most helpful in mastering the business management competencies?
Which sessions were least helpful in mastering the business management competencies?
What can we do to improve the sessions?

Data from faculty observations were gathered during the sessions and reviewed during weekly planning and debriefing phone conferences. This information was also aggregated into a report at the end of the sessions. Student responses to polling questions were compiled and a number of

lessons learned were gleaned from this process. Lessons learned about how to effectively use Adobe Acrobat Connect as a tool for active learning are discussed in the following paragraphs.

The first lesson learned was that online students could access the Adobe Acrobat Connect web conference quickly and with little technical trouble. Several students commented on the ease of use of Adobe Acrobat Connect. One student commented, "the Adobe Connect environment is very user friendly, easy to understand, follow and participate in." Students accessed the web conferences using a web link provided in the e-mail invitation to the session. Student responses to an end of program survey indicated that the students found the web conferences easy to access.

An unexpected plus in the Adobe Connect web conferencing software was the ability to poll students during the workshop. The polls were developed by the lead faculty member and were used to evaluate student understanding of concepts being discussed. One lesson learned is that polling is an effective real-time assessment tool for faculty. The polls were used to evaluate student comprehension of concepts addressed during the discussion. Faculty facilitators were able to expand on concepts, ask leading questions, and to provide examples when polls indicated that students had not mastered the concepts being discussed. Polls were also used to evaluate student perceptions of the workshop. An end-of-session poll was administered to gather student feedback on the effectiveness of the session. The facilitators determined that more polls should be included in future workshops to assess student understanding of concepts presented.

A third lesson learned is that visual slides need to be used at the beginning of each session to orient students who are participating in the session. In planning the sessions, it was assumed that the same students would participate in each of the sessions, but the students participating varied by topic. Students needed a basic orientation to the Socratic Method used in the workshops and instruction on how to use polling and messaging within Adobe Acrobat Connect at the beginning of each session.

The PowerPoint presentations were effective in getting the student discussion started on each topic. The PowerPoint slides often contained too much information. One lesson learned was to reduce the amount of text on each slide. Slides which contained too much text were difficult to read on the computer screen. Also, students were more collaborative and offered more diverse examples when less information was provided in the PowerPoint slide. A fourth lesson learned was that being clear and concise in the design of the questions was important in drawing students into the discussion.

The final lesson learned was that recording of student interaction in Adobe Acrobat Connect does not work if the audio portion of the workshop is supported with phone conferencing. In order to record the audio portion of the conferences, the facilitators and the students need to have microphones on their computers and to interact via the web. The facilitators of the Adobe Connect sessions planned to record the audio portion of the conferences and archive the conferences for student access at a later date. The use of a phone conferencing bridge resulted in no archived audio for the sessions. Archived sessions of the course included the PowerPoint slides and notes taken during the session by one of the facilitators.

Conclusion

Data gathered from student interviews indicated that the student experience using Adobe Connect was positive. The Adobe Connect platform was an effective web conferencing tool that online students could master in a short period of time. Student comments highlighted the ease of use for the web conferencing program. The only negative feedback received about the student experiences with the sessions was around the lack of archived audio transcripts for students to review at a future time. The technical skills of students participating in the Adobe Connect sessions may not be representative of a typical student population as students in these sessions had several terms of experience in an online learning environment.

Online classroom platforms allow the college instructor to facilitate non-linear learning in a linear (online) environment (Chen, 2002; Yang, Newby, & Bill, 2008). Learning management systems typically use asynchronous discussion boards or forums to allow students and instructors to interact and explore various topics in an asynchronous environment (Hauben, 1996; Sahu, 2008). Many students find the self-directed, pre-defined instruction beneficial in their learning, but others struggle with this self-paced form of instruction. The Adobe Acrobat Connect sessions offered in this case study provided an effective alternative for students to interact and engage in the course material using the Socratic Method. Facilitator feedback indicated that student collaboration and active learning occurred as part of the web conferences. Asynchronous web conferencing tools, like Adobe Connect, provide new opportunities to meet the needs of diverse learners.

As educators continue to look for teaching techniques that are dynamic, interactive and promote critical thinking and problem solving skills, web conferencing techniques such as Adobe Connect are one way to help students share and collaborate their experiences. Although some research has been done on using web conferencing to facilitate student collaboration (Winter & McGhie-Richmond, 2005; Diziol, Walker, Rummel, & Koedinger, 2009), further research on the effectiveness of video conferencing and similar techniques should be employed to determine the value of allowing students to share their learning experiences in a synchronous environment. In addition, further study on the correlations between various learning styles and the effectiveness of this type of learning is also warranted.

References

Allen, E., & Seaman, J. (2008). *Staying the course*. Babson Survey Research Group: The Sloan Consortium.

Chen, S. (2002). A cognitive model for non-linear learning in hypermedia programmes. *British Journal of Educational Technology, 33*(4), 449-460.

Chou, P. (1994). Guide to managing a telecourse/distance learning program. Suisun, California: Learning Resources Association. Retrieved from http://www.infrastruction.com/barriers.htm

Diziol, D., Walker, E., Rummel, N., & Koedinger, K. (2009, December 18). Using intelligent tutor technology to implement adaptive support for student collaboration. *Educational Psychology Review, 22*(1), 89-102. DOI 10.1007/s10648-009-9116-9

Hargreaves, J. (2008) Risk: The ethics of a creative curriculum. *Innovations in Education and Teaching International,45*(3), 227-234.

Hauben, R. (1996). Chapter 2. The evolution of USENET: The poor man's ARPANET. In Netizens, *On the history and impact of the Internet.* Retrieved from http://www.columbia.edu/~rh120/ch106.x02

Healy, A. (2009). Best practices of the knowledge society. Springer Berlin Heidelberg publishing. DOI: 10.1007/978-3-642-04757-2_6

Kunselman, J., & Johnson, K. (2004). Using the case method to facilitate learning. *College Teaching, 52*(3), 87.

Maxwell, K.J. (2009). *Introduction to the Socratic Method and its effect on critical thinking.* Retrieved from the Socratic Method Research Portal http://www.socraticmethod.net/

Pang, K. (2008). Sophist or Socratic Teaching methods in fostering learning in US graduate education. *International Journal of Learning*, *15*(6), 197-201. Retrieved from Education Research Complete database.

Reushle, S. & Loch, B. (2008). Conducting a trial of web conferencing software: Why, how, and perceptions from the coalface. *Turkish Online Journal of Distance* Education, 9(3), 19-28.

Sahu, C. (2008). An evaluation of selected pedagogical attributes of online discussionboards. In *Hello! Where are you in the landscape of educational technology? Proceedings ascilite Melbourne 2008*. http://www.ascilite.org.au/conferences/melbourne08/procs/sahu.pdf

Winter, E.C. & McGhie-Richmond, D. (2005). *Using computer conferencing and case studies to enable collaboration between expert and novice teachers*.21(2), 118-129. Retrieved EBSCO Host database.

Yang, Y.C., Newby, T., & Bill, R. (2008) Facilitating interactions through structured web-based bulletin boards: A quasi-experimental study on promoting learners' critical thinking skills. *Computers & Education*, 50(4), 1572-1585.

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Editor's Note: This is an interesting paper in that it moves forward from studies of homework before the computer era, and draws focus to options available for an increasing number of students today. Computer offer certain efficiency and motivational opportunities, but parental and environmental influences continue to play an important role. The authors have taken great care in setting up the experimental conditions, and are cautious in analysis and verification of testing conclusions.

A Study of the Attitudes Use of Information Technology and Multimedia Tools by 8th Graders in Realisation of Homework Purposes and Techniques

Erdem Ongun, Dilek Altas, Askin Demirag
Turkey

Abstract

This study aims at measuring the attitudes of secondary school students towards the use of information technologies ranging from the Internet, editing and multimedia tools while they are doing their homework in the light of the Turkish Ministry of National Education's regulation related to elementary and secondary school students' extra-curricular activities. The centre of the research is 8th graders from five randomly chosen schools and similarly 435 students in the city of Istanbul. This study gathered quantitative data on gender, parental education, students' attitudes towards and efficiency in the use of computers and the Internet tools while doing homework. The findings indicate that learners enjoy using computer and the Internet tools and they developed a positive attitude towards doing homework on the computer and the Internet.

Keywords: homework, education, motivation, information and communication technologies, multimedia, Internet, young learners, statistical analysis

Introduction

Involvement in a learning practice is a multi-faceted dimension that encircles learners' both internally and externally. Universally, actors of the learning process are mainly known to be learners and teachers. The other two essential parts of that complicated process are the setting where learning and teaching are realised and the materials used. So what about homework? Homework, as an intermittent medium, has often been a matter of discussion as to whether it can be regarded as a reinforcement or extra load on students' shoulders that they have to carry home and which they often pretend doing for the sake of their parents or teachers' contentment. In this regard, homework needs to be studied more closely in terms of its role in the learning process and whether it should be inside or outside the learning and teaching circle. Developing technologies offer a wide range of use of facilitators in many disciplines as well as in education. Today's learners no longer visit concrete libraries to prepare their homework or projects. On the contrary, they just click on the entrance of virtual libraries where they can find millions of downloadable or copyable sources. As a result, the new trend in doing homework has evolved with great changes and influences from past to present. The issue bears essential focal points to study regarding students' changing perceptions and attitudes and importance and style of new homework trends especially with young learners.

Literature Review

Technological advances also permit us to ascertain whether new instructional methods modify or even magnify children's learning style. Some studies report change in learning style as a function of computer-assisted learning. As the Internet and other computer-based communication tools become prevalent in homes, students' use of these tools for their homework will rise. Researchers

have already begun to examine the ways that families make use of computer technology for educational purposes. Students have already been using computer technology in completing their homework assignments, for example, by searching web sites and using CD-ROMS for research projects, communicating with peers and experts through the Internet, and using the computer as a tool for writing and graphing. A systematic use of computer technology for homework design offers other exciting possibilities for individualizing homework for students.

Homework is often regarded as an outside activity. Homework is a kind of out-of-school learning that has not yet received the serious attention that it merits in the research literature. Learning at school and at home are similar in several ways. The student's ability to learn does not change. The same level of intellectual ability is used to learn at home and at school. Learning at school and at home are also different in several ways: e.g.: the quality of the teacher– learner interaction, the dynamics of the classroom group, and other characteristics of the school in which learning takes place. Similarly, out-of-school learning at home is affected by a myriad of additional and unique factors not found in school: The characteristics of the home environment; the influence of parents, siblings, and friends; and the existence of other activities that compete for the children's time, attention, and effort. However, the major difference between learning at school and at home is that the learner has choices not only about whether to do the homework at all, but also about the circumstances and surroundings in which to do it.

Homework is a powerful tool that can contribute to the advancement of children's education and knowledge or it can do more damage than good to these enterprises. Proper use of homework can lead to significant improvement in academic achievement. Homework is an ongoing enterprise in all academic settings, it is there to be used and does not have to be discovered or invented. However, in its current form it is often part of the problem and not part of the solution. In order for homework to become a positive and powerful force in education, change will have to take place about how homework is understood, how it is used in schools, and how it is done at home. On the other hand, results from a related study show that overall, more students wanted to and actually do their homework well to satisfy parents and teachers, although some students commented that they do their work for themselves but not to please others; these students represented a minority in the classes tested.

Marzano (2001) states that homework and practice are instructional techniques are well- known to teachers. Both techniques provide students with opportunities to deepen their understanding and skills relative to content that has been initially presented to them.

School systems need to give serious attention both to increasing awareness of homework motivation and preferences in children and in parents and to providing them with the information and techniques required to accommodate homework assignments to these preferences as well as their motivation levels and sources (Roberta M., 2000).

Individual differences play an important role in assigning homework. As far as visual and auditory tools are concerned, Milgram (2000) suggests a wide variety of ways that perceptual-physical preferences can be taken into account while assigning homework to students. A few examples of these can be given as auditory and visual. Some children prefer homework assignments that require them to listen to tapes or CDs that contain material to be used in doing the homework, and also prefer to hear homework instructions. Other learners prefer assignments that involve reading or watching films, and prefer to see written homework instructions. Computers, in that sense, provide a rich environment supporting both auditory and visual aids.

In his study related to age differences in understanding the social complexity of the Internet, Yan (2003) suggests that children begin to understand the Internet as a complex artefact cognitively and socially during the 9–12 age range. Again, the older students get the more they develop positive attitudes towards exploiting new media technologies such as the Internet and computer

mediated tools in doing or perhaps organizing homework. In addition to this, Kupperman and Fishman (2001) state that as more and more K—12 students gain access to the Internet at home and at school, the potential exists for students, families, and schools to use this resource in new ways.

The Internet offers a direct, effective, and novel method for communicating varied information that can be accessed at the convenience of its users: it can serve as an interactive tool for individualizing homework and supporting the involvement of families in the homework process (Salend, 2004).

In the study carried out by Allain and Williams (2006), four sections of introductory astronomy were compared in various homework situations, from no graded homework to graded homework online. Results show that there are no significant differences in conceptual understanding or test scores. Students did report spending more time studying course materials outside of class when online homework was graded. Aksüt et al. (2008) in their study state that students are having difficulties in doing homework at Internet cafés, their teachers are incompetent in using information technologies and public and school libraries don't meet the needs for "performance homework" that was recently put forward by the new regulation. Along with technological renovation of schools, Aksüt (2008) and colleagues also suggest that students' homework performance will be positively affected if teachers are given intensive training on information and education technology use.

In their study, Cakiroglu et al. (2008) state that although students defined it as plagiarism to use another person's idea or a part of their work and pretend that it is your own, they still did not hesitate to copy and paste from the Internet while preparing homework and projects.

Risks might appear at an excessive and uncontrolled use of such tools on both students' and parents' side as ministry's regulation over generalises homework preparation instruments without any specifications regarding rapidly changing up-to-date technologies. Such risks are also described in Kodippili and Senaratne's (2008) study where they have some interesting findings that should be considered as shortcomings when drawing inferences from a comparison of computer-generated interactive mathematics homework being more effective than traditional instructor-graded homework. The risks are: lack of complete random assignment of participants, small sample size, failure to control for extraneous influences such as 'students receiving tutorial support from the school and, finally, the effect of intervening variables such as gender, age, etc. These shortcomings may raise questions as to whether computer-generated homework preparation can be recommended by teachers and parents without any limitations as students seem to enjoy and exploit not only innovative tools but also fun ones. Similar to Kodippili and Senaratne's (2008) study, Smolira (2008) examined student perceptions concerning online homework assignments in an introductory finance class. In general, students felt that online homework was preferable to traditional homework assignments that are turned in to the instructor. In addition, students reported that the homework assignments increased their understanding of the material and the time they spent in preparing for the class. Finalising the issue of online versus traditional homework, Mendicano (2009) found that students learned significantly more when given computer feedback than when doing traditional paper-and-pencil homework. Given the large effect size, it may be worth the cost and effort to give web-based homework when students have access to the needed equipment, such as in schools that have already implemented one-to-one computing programs.

On the other hand, parents' role in their children's involvement in homework should not be disregarded. Wight (2009) and colleagues state that education may facilitate positive parenting practices. Accordingly, parents with higher levels of education negotiate the demands of work and family more successfully—enhancing their ability to be present during high-risk periods for

teens. They conclude that teenagers from these better-educated parents might be expected to spend more time engaged in educational-related activities such as homework.

As a final point to consider in terms of sexual differences regarding type of homework performances, findings in a study carried out by Eralp (2008), show that 70% of students had positive attitudes towards online homework assignments (OHS). Males tend to use online homework assignments (OHS) more effectively and practically than females, however, in terms of ethical issues female students are more careful. Computer ownership and increasing proficiency in computer and Internet use affects students' attitudes towards OHS positively. Mothers' and fathers' educational background appears to have an effect on students' attitudes in terms of practicability and ethics.

Current studies point out that homework is not a single activity that is assigned to students. It is rather an involvement covering many other actors in the process. Instruments used, parental interest and background, teachers and sexual differences are some of these factors that researchers have drawn greater attention to.

Method

The study aims at measuring the relationship between the attitudes of 8th graders towards the use of information technologies ranging from the Internet, editing and multimedia tools (visual and auditory) and to what extent variables such as punctuality, quickness and better performance affect students' organizing their homework in the light of the Turkish Ministry of National Education's regulation related to elementary and secondary school students' extra-curricular activities. For data analysis, Chi-Square Test was used as the variables were qualitative.

Data Collection Technique and Sample Properties

Students responded to a questionnaire consisted of 13 questions. While preparing the questions, Part III of the Turkish Ministry of National Education's regulation was taken into consideration. The regulation related to elementary and secondary school students' extra-curricular activities overall has six parts with 31 articles. Part III of the regulation specifically includes statements related to objective (Article 8) and importance (Article 9) of doing homework and homework preparation techniques (Article 21). Article 8 has 13 paragraphs clearly defining the main objectives of homework. These basically include statements such as promoting the habit of doing homework more attentively and punctually, developing necessary knowledge and skills for planning, being able to collect required sources and materials for homework and use them accordingly and develop different perspectives about homework, building self-confidence, communication and cooperation along with attitudes towards observation, research, exploration and creativity in homework. Regarding the importance of doing homework Article 9 clearly defines homework as a part of the teaching and learning process which students enjoy doing it on their own or in groups which have the will and excitement for achievement and study. Finally, Article 21, which deals with homework preparation techniques, states that homework can be prepared using techniques such as reading course books and readers, observation, presentation, employing different forms of interviewing and application of questionnaires. The questionnaire questions in the study included respectively sex, parents' educational background, Internet use goals and settings (home, school, Internet café or so.), and online and offline multimedia tools used for organizing homework. Thus the questionnaire was developed to suit the associate grade students and the above mentioned articles of homework regulation in the present study. The first item was about students' sex. The next two questions were mainly about their parents' education level and finally, in last 10 questions participants responded on a 2 and 5 point scale (a) Yes; (b) No and multiple choice) as to the efficiency, frequency and possible benefits of the use of online and offline tools while editing and organizing their homework.

The sample for this study included 435 students who were randomly chosen from 8th grades in five elementary and secondary schools in the city of Istanbul. The reason for choosing an advanced grade for the study lies in the fact that those students have more and better computer literacy skills compared to lower grades and these students are more likely to exploit benefits of technological tools.

Statistical Analysis

After the questionnaire data were collected, they were recoded and analysed using the Statistical Package for the Social Sciences (SPSS), version 17. Relationships between variables were analysed using Phi coefficient as some variables were dichotomous. If the Phi-coefficient happens to have a nominal scale, only in 2*2 dimensional Tables, it is a coefficient that helps determine the level of unity between variables (Ozdamar, 1999). This coefficient (Cilan, 2009) is calculated as $\emptyset = f_{12}(f_{21})-f_{11}(f_{22}) / \sqrt{f_{.1}f_{.2}f_{1.}f_{2.}}$

Findings

Frequency Analysis

Participants in the study were 48.7% male and 51.3% female. This ratio provides an equal targeted balance in data assessment process regarding gender. As for the parental education percentages of participants, it was found that 11% of mothers were primary school dropouts; 34% had primary school diplomas; 17% had secondary school diplomas; 26% had high school diplomas and, finally, and only 12% were university graduates. The collective data related to fathers' educational background shows that 6% of fathers were primary school dropouts; 25% had primary school diploma; 23% had secondary school diploma; 26% had high school diploma and 20% were university graduates. Although it is not directly related with our study, we wanted to look into the data to see whether mothers or fathers, regarding their educational background, could be of any help to their children with their homework in terms of their guidance. The related data shows that fathers are more educated than mothers. Still overall, only 32% of parents are university graduates, which may signify an indirect relationship between a higher education level versus higher computer literacy. Data regarding computer and Internet use according to frequency and place starting with home use shows that 32% of students used their computers and the Internet frequently; 41% did so moderately; 18% used them little; 9% of students didn't use their computers at home at all. Data concerning computer and the Internet use at school shows that 0,5 of students used their computers and the Internet at school frequently, 7,6 % used moderately; 60% used little and finally 32% of students did not use their computers and the Internet at school at all. Data concerning computer and Internet use at Internet cafés shows that 4% of students used them frequently; 15% moderately; 60% of them used little; 28 % of students didn't use them at all. Apart from this, 12% of students answering the questionnaire stated that 4% of them used computers and the Internet moderately in other places apart from those listed above while 12 % used them little.

Ninety-four % of students stated that they had an e-mail address while 6% reported not to have one. This data shows that students greatly tend to prefer written communication on line. In addition to this, 64% of students reported that they used chat programs in general while 36% did not, which signifies that students prefer snd enjoy online texting. As far as students' attitudes towards the goals of benefiting from computers and the Internet are concerned, results from the related question are as follows.

From **Table 1** below showing for what purposes computer and the Internet are used by students, it can be inferred that a majority of students used computers and the Internet mainly for doing homework (67,6%) followed by those who used them for fun and gaming (64,1%); doing

research (50,3%) ; for chat (49,2%). This means students are inclined to use technology for fun as a secondary choice.

Table 1
Question 8: Goals of using computers and the Internet

For what purposes do you use computer and the Internet?		*%*
Chatting	*Yes*	*49.2*
	No	*50.8*
For fun and gaming	*Yes*	*64.1*
	No	*35.9*
Doing research	*Yes*	*50.3*
	No	*49.7*
Doing homework and studying	*Yes*	*67.6*
	No	*32.4*

Correlation Analyses

As to whether there is an independence between "organizing homework better" and "doing homework more quickly and punctually" and "planning homework better" by using computer and the Internet tools while doing homework was evaluated through Phi-Correlation coefficient as the data were dichotomous. Obtained findings are displayed in the Table below.

Table 2
Using computer and the Internet tools while doing homework

	Phi Correlation Value	**Sig.**
I can organise my homework better	-0.002	0.975
I can organise my homework more quickly and punctually	0.02	0.682
I can plan my homework better	0.022	0.647

According to the results in **Table 2**, no significant relationship was found between the Internet tools (browsers, e-mail, texting services-MSN etc) and variants.

Table 3
Using MS Office Tools

	Phi Correlation Value	Sig.
I can organise my homework better	0.143	0.003
I can organise my homework more quickly and punctually	0.01	0.827
I can plan my homework better	0.14	0.004

In **Table 3**, a relationship was found between MS Office tools and "I can organise my homework better" (sig. =0.003) and "I can plan my homework better" (sig. =0.004)

Table 4
Using Visual Tools

	Phi Correlation Value	Sig.
I can organise my homework better	0.175	0.000
I can organise my homework more quickly and punctually	0.092	0.056
I can plan my homework better	0.088	0.065

Table 4 shows that a significant relationship was found between the use of visual tools and "I can organise my homework better" at 5% (sig. =0.000).

Table 5
Using Auditory tools

	Phi Correlation Value	Sig.
I can organise my homework better	0.175	0.000
I can organise my homework more quickly and punctually	0.092	0.056
I can plan my homework better	0.088	0.065

In **Table 5**, a significant relationship was found between the use of auditory tools (players and recording tools) and "I can organise my homework better" (sig. =000).

Table 6
Crosstab for Gender -Question 10: "I can organise my homework better by using visual and auditory tools on the computer and the Internet"

Gender		Q10		Total
		No	Yes	
Male	Count	25	187	212
	% of Total	5.7%	43.0%	48.7%
Female	Count	15	208	223
	% of Total	3.4%	47.8%	51.3%
Total	Count	40	395	435
	% of Total	9.2%	90.8%	100.0%

As seen in **Table 6,**. 48.7 % of students answering the questionnaire are male and 51.3 % are female. 47.8 % of female and 43% of male students reported that they could organize their homework better by using related tools on the computer and the Internet.

Table 7
Chi-square Test

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	3.340[a]	1	**.068**	
Continuity Correction	2.761	1	.097	
Likelihood Ratio	3.366	1	.067	
Fisher's Exact Test				.071
Linear-by-Linear Association	3.333	1	.068	
N of Valid Cases	435			

Table 7 shows that as the sig. value related with Chi-square test is 0.068, it was found that there is a significant relationship between gender and "I can organize my homework better using computer and the Internet tools" statement at 5% significance level.

Table 8
Gender – Question 11: "I can organise my homework more quickly and punctually by using the tools on the computer and the Internet" Crosstab.

Gender		Q11		Total
		No	Yes	
Male	Count	37	175	212
	% of Total	8.5%	40.2%	48.7%
Female	Count	22	201	223
	% of Total	5.1%	46.2%	51.3%
Total	Count	59	376	435
	% of Total	13.6%	86.4%	100.0%

As seen in **Table 8**, 46.2 % of female students and 40.2 % of male students stated that they could do their homework more punctually and quicker by using the tools on the computer and the Internet.

Table 9
Chi-square Test

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	5.337[a]	1	**.021**	
Continuity Correction	4.709	1	.030	
Likelihood Ratio	5.377	1	.020	
Fisher's Exact Test				.025
Linear-by-Linear Association	5.324	1	.021	
N of Valid Cases	435			

Table 9 shows that as the sig. value related with Chi-square test is 0.021, it was found that there is a significant relationship between gender and "I can do their homework more punctually and quickly by using the tools on the computer and the Internet" statement at 5% significance level.

Table 10
Gender – Question 12: "I can plan my homework better by using the tools on the computer and the Internet" Crosstab.

Gender		Q11		Total
		No	Yes	
Male	Count	33	179	212
	% of Total	7.6%	41.1%	48.7%
Female	Count	19	204	223
	% of Total	4.4%	46.9%	51.3%
Total	Count	52	383	435
	% of Total	12%	88%	

As seen in the **Table 10,** 46.9 % of female and 41.1 % male students stated that that they can plan their homework better by using the tools on the computer and the Internet.

Table 11
Chi-square Test

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	5.126[a]	1	.024	
Continuity Correction	4.479	1	.034	
Likelihood Ratio	5.171	1	.023	
Fisher's Exact Test				.027
Linear-by-Linear Association	5.114	1	.024	
N of Valid Cases	435			

Table 11 shows that as the sig. value related with Chi-square test is 0.024, it was found that there is a significant relationship between gender and "I can plan my homework better by using the tools on the computer and the Internet" statement at 5% significance level.

Conclusion

As specified in the related parts of the National Education Ministry's regulation related to elementary and secondary school students' extra-curricular activities, homework, an essential tool in education, is meant to serve as a basic educational medium that helps students develop and improve personal and academic skills. Our results regarding the attitudes towards the use of information technology tools by elementary and secondary school students in realisation of homework purposes and techniques show that parents' educational background plays an important role in homework performance. This reminds us of studies of parental involvement in homework with negative and positive effects on parents and children. Although all parents might have the best intentions when they try to help children with homework, some parents have more skills or advantages than others do. They may, for example, have more education, better understanding of how to break a problem into parts, or more effective motivational techniques (Voorhis, 2003). In addition to this, results from Xu's (2010) study suggest that parents can exert positive influences on homework purposes as perceived by children. They further suggest that the kind of direction parents give to children matters more than if parents have a higher education. This is good news for families from diverse educational and socioeconomic backgrounds. Families of all kinds can play a role in helping their children develop positive attitudes toward homework during the secondary school years.

Overall, data concerning frequency and spatial use of computers and the Internet by students show that there is little reinforcement at school for students to use computers and the Internet. Whereas, they more often use them at home use and use them little at Internet cafés. This brings the issue to a controversial point whether there is a control or supervision over students' home use of computers and the Internet while doing homework. As suggested by Milgram, (2000), the goal of a computer in every home is not yet realized, but teachers should recognize that computers can be the homework tool of choice for many learners and should use them in planning individualized homework assignments.

While our participants regardless of gender widely enjoy online communication through either text messaging or chatting, they also state that their main objective in using computer and the Internet is to do research and homework. This shows that as young learners they are quite aware of possible and effective tools available on their computers and the Internet. As computer technology offers a comprehensive content of visual and auditory tools, teachers and families need to take this into consideration when assigning homework to students.

Although most children like participants in our study feel more comfortable with the use of online and offline tools in their engagements, it should be kept in mind that apart from their enhanced efficiency, computer technologies alone should not be prescribed as a unique cure for extra-curricular educational activities such as homework. Our study is meant to shed light on what attitudes students in the study have towards computer mediated homework performance and preparation techniques in comparison to what is stated in the school regulation. Obtained results in general put forward a positive but still attentive approach concerning students' use of computers and the Internet tools in doing homework. The line between education and entertainment is so delicate that objectives and tools stated in the Ministry's regulation regarding homework can change lines depending on how computers and the Internet enter the scene. We hope that this study has managed to draw attention to highlighted theory and changing practice of students' homework preparation attitudes and techniques for the present and for future applications.

References

Aksüt, M. et al. (2008) "The Attitudes Of Elementary And Secondary School Students Towards Internet Use While They Are Doing Their Homework" Retrieved: 15.03.2010 http://ietc2008.home.anadolu.edu.tr/ietc2008/119.doc

Allain, R. &, Williams, T. (2006) The Effectiveness of Online Homework in an introductory Science Class. Journal of Collge Science Teaching.

Altun, E. (2008) 6th 7th and 8th Graders' Attitudes Towards Online Homework Assignments Sites *The Turkish Online Journal of Educational Technology – TOJET, ISSN: 1303-6521 volume 7 Issue 4 Article 1*

Çakıroglu, Ü. et al. (2008) "The Effect of Internet about Plagiarism during Homework Preparing Period" Retrieved: 11.02.2010 http://ietc2008.home.anadolu.edu.tr/ietc2008/221.doc

Çilan, A. Ç.; (2009). Sosyal Bilimlerde Kategorik Verilerle İlişki Analizi-Kontenjans Tabloları Analizi, Pegem Akademi, Istanbul, (102)

Kodippili,A. & Senaratne, D.(2008) Is computer-generated interactive mathematics homework more effective than traditional instructor-graded homework? *British Journal of Educational Technology Vol 39 No 5,(* 928–932)

Kupperman, J. & Fishman, B.J., (2001) Academic, Social, and Personal Uses of the Internet: Cases of Students from an Urban Latino Classroom, *Journal of Research on Technology in Education W1nter 2001-2002: Volume 34 Number 2*

Marzano, R. J.(2001) Classroom Instruction that Works : Research-Based Strategies for Increasing Student Achievement. Alexandria, VA, USA: Association for Supervision & Curriculum Development, (60).

Mendicano, M., Razzaq. L., & Heifernan, T. N. (2009) A Comparison of Traditional Homework to Computer-Supported Homework *Journal of Research on Technology in Education 41(3),(351-359)*

Milgram, R. M. (2000) Homework : Motivation & Learning Preference. Westport, CT, USA: Greenwood Publishing Group, Incorporated, (4-169)

Özdamar, K. (1999). Paket Programlar İle İstatistiksel Veri Analizi-1, Kaan Kitabevi, (171)

Salend, J. S. Et al. (2004) Using the Internet to Improve Homework Communication and Completion. *Teaching Exceptional Children. Vol.36, No: 3,(65)*

Smolira, C. J. (2008) Student Perceptions of Online Homework in Introductory Finance Courses, *Journal of Education for Business*, Heldref Publications.

Wight, R. V. et al. (2009)The time Use of Teenagers, *Social Science Research 38, (792–809)*

Voorhis, V.L. F.(2003) Interactive Homework in Middle School: Effects on Family Involvement and Science Achievement. *The Journal Of Educational Research, Vol.96, No:6*

Xu, J. (2010) Homework Purposes Reported by Secondary School Students: A Multilevel Analysis *The Journal of Educational Research, 103,(171–182)*

Yan, Z. (2003) Age differences in children understands of the complexity of the Internet, Applied Developmental Psychology 26 (2005) (385–396).

Yılmaz, B.M. (2008) "Analysing the Computer Addiction Aptitudes of 6th And 7th Grade Students According to Different Variables" Retrieved: 15.03.2010, Retrieved on 12.02.2010 http://ietc2008.home.anadolu.edu.tr/ietc2008/115.doc

Additional Reference

Turkish Ministry of National Education (Milli Eğitim Bakanlığı) http://mevzuat.meb.gov.tr/html/20336_0.html (visited: 20.06.2010)

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Editor's Note: This paper capitalizes on student's experience with Web 2.0 tools to enhance learning through reflection. It needs to be replicated with different teacher-student populations and subject matter. However, the results are significant and the underlying rationale is convincing.

Connecting the Dots: Integrating Technology into Learner Reflective Practices

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Abstract

"Reflection is central to all learning" (Bruner, 1960, p. 13) and the skills required of the reflective teacher and the individual attempting to become an independent learner are similar. With today's twenty-first century learners, it is important that educators advocate integrating twenty-first century skills into their reflection activities. In Ray and Coulter's study (2008) on the use of blogs by teachers for reflective purposes, the authors conclude that "Teachers would benefit from combining the skills of technology and reflection," and that "these kinds of public technologies provide a way for teachers not only to analyze their own practice, but also to share their reflections with others" (p. 20). Teachers and students can now avail themselves of various online and computer-based applications in order to reflect on their learning. This paper briefly examines research on reflection in education and the use of new online technologies as tools to assist learners in their reflection experiences. The results of a survey completed by students in the authors' three university classes who used online technologies to reflect on their learning experiences indicate that there are positive benefits for integrating web-based tools into the reflection process.

Keywords: technology, web 2.0, reflection, reflective, practices, online, computer, virtual, educators, students, learners, university, course, class, technologies, integrate, web-based, computer-based, tools.

Introduction

Reflective teaching and learning practices have been leading meaningful educational change for many years (Dewey, 1933; Schöen, 1983; Loughran, 1996; Mezirow, 1990; Bartlett, 1990; Ross, 1990; Langer, 1997). In *Experience and Education,* Dewey (1998) stated that: "To reflect is to look back over what has been done so as to extract the net meanings which are the capital stock for intelligent dealing with further experiences. It is the heart of intellectual organization and of the disciplined mind" (p. 110). In the act of looking back, the individual examines what "has been experienced, and recreates the events, emotions, and happenings of the situation" (Lowery, 2003, p.23) in order to deal effectively with future experiences.

Reed and Bergenann (2001) state, "Reflective people continue the introspective process while they are actively pursuing information and clarification. Reflection is not difficult. Often it merely requires answering simple questions: What did I do? How do I feel? Why do I feel that way? What was the best thing that happened? Were there any things I could have done better? What would I do differently if I could do it again?" (p. 9).

Reflection then connects new learning experiences to previous learning and, ideally, results in the transformation of information into meaningful knowledge. "Reflection is seen as a process of reconstructing classroom enactments, including both cognitive and affective dimensions" and "to learn from reflection on experience" (Lowery, 2003, p. 23). This is reflection-on-action (Schon, 1983) or guided reflection and it leads to "greater student achievement and success in the classroom. Benefits from reflective teaching include increases in confidence, autonomy, and self-

efficacy for teachers…students benefit by reflecting on their own learning to make sense" (Lowery, 2003, p. 29) of their discipline.

Teachers have assisted learners to reflect through the use of student journals, individual and group feedback sessions, case analyses, and other activities (Sparks-Langer and Colton, 1991). They have also provided opportunities for students to actively construct new learning through insights that they otherwise might not have made. One example of this is the use of question prompts and teacher affirmations such as "Why do you think that happens?" and "You can learn from what doesn't work for you." (Canning, 1991, p. 19).

Students today, however, are not yesterday's learners. "Today's youth are frequently creative, interactive, and media oriented; use Web 2.0 technologies in their everyday lives; and believe that more use of such technologies in school would lead to increased preparation and engagement" (Greenhow, Robelia & Hughes, 2009, p. 247). "Web 2.0 is linking people…people sharing, trading, and collaborating…" Wesch (2007) notes in his popular video, *Web 2.0…The Machine is Us/ing Us*, viewed by more than eleven million individuals on YouTube. "We'll need to rethink a few things", and among others, he lists "ourselves". Similarly, "Engage me! Engage me! We are digital learners" plead twenty-first century learners in a short, four-minute video also on YouTube titled, *A Vision of K-12 Students Today*. These students, digital natives who "expect to be able to create" (Nesbitt, 2007), demand the use of technologies that at times challenge the knowledge and skills of their teachers, digital immigrants (Prensky, 2001). Researchers are investigating the use of online technologies for reflective purposes. For example, Ray and Coulter (2008) examined teacher blogs for amount and depth of reflective content and concluded that blogs that delved deeper than descriptive accounts of experiences "could lead to changes in practice" (p. 6).

Teachers and students can now avail themselves of various online and computer-based applications in order to reflect on their learning. This paper briefly examines how the two authors incorporated technology into reflection assignments in their virtual and hybrid courses. Results of a survey conducted after the reflection assignments demonstrate that there are positive implications for integrating web-based tools into the reflection process.

Technologies for Reflection

Russell Rogers (2001) notes that implied in the various definitions of reflection is the notion of active engagement in the reflection process. Traditionally, reflective methods, such as journaling, questioning, portfolios, presentations, and role playing have been dominated by the spoken or written word and have not used technology. With today's twenty-first century learners, however, it is important that educators advocate integrating twenty-first century skills into their reflection activities.

The Partnership for 21st Century Skills (2009) envisions a future in which students are prepared for work and life in the first decades of this century. Two key skill areas in their framework of twenty-first century student outcomes are (1) learning and innovation, and (2) information, media, and technology skills. Learning and innovation skills consist of creativity and innovation, critical thinking and problem solving, and communication and collaboration. Information, media, and technology skills are those that require information literacy, media literacy, and ICT (information, communications, and technology) literacy. This set of skills, which include higher order thinking skills, personal abilities, and technology literacy, are fundamental to meeting the challenges of a knowledge-based economy (Saltpeter, 2003). According to Alexandra Overby (2009), unless educators begin infusing technology into the curriculum, the gap between the needs of this generation of tech-comfy learners and the ability of educators to create meaningful learning opportunities will steadily increase.

While Overby used weblogs for reflecting on art production, Lisa Bucciarelli's students used The MyEport ePortfolio system (www.myeport.com) to document their learning with digital portfolios Buciarelli (2009) states, "Web 2.0 tools, when properly infused into the curriculum, create a dynamic learning environment and foster both collaborative opportunities and individual autonomy" (p. 32). This dynamic learning environment incorporates the use of appropriate technology to reconnect learners to meaningful learning opportunities and enables them to actively engage in the reflection process.

Reflection Assignments

In spring, 2010, twenty-one students in a university hybrid **Composition II** course used both web-based and computer-based technology tools to produce midterm reflection assignments. Whereas Instructor I assigned the reflection midway through a fifteen-week hybrid course, Instructor II's online students completed the reflection at the end of the spring, 2010 semester. Eighteen **Introduction to Education** students completed the assignments, embedded them in a discussion forum in the course, and commented on one another's reflections. Twenty **Introduction to Computers in Education** students developed their reflection assignments, embedded them in their team blogs, and commented on each others' reflections.

The palette of technological tools for formative and summative reflection activities in the authors' courses offered students the opportunity to choose a medium of communication with which they were comfortable. One guiding question was "Do students value using various computer- and web-based technologies for the purposes of reflecting on course learning experiences?" The technologies offered were:

Technology	Location
Blogger	www.blogger.com
loggel	www.loggel.com
ToonDoo	www.toondoo.com
Photo Story 3	http://www.microsoft.com/windowsxp/using/digitalphotography/photostory/default.mspx
Prezi	www.prezi.com
Voki	http://www.voki.com
Windows Movie Maker	http://www.microsoft.com/windowsxp/downloads/updates/moviemaker2.mspx
Picassa 3	http://picasa.google.com/

At the end of the spring semester, students in all three courses completed an eight-item survey on www.surveymonkey.com about their reflection assignments.

Survey Results

Forty-seven of fifty-nine students in the three courses taught by the two instructors completed the survey. More than two-thirds of the respondents rated themselves as having intermediate technology proficiency. All students with the exception of two valued the incorporation of technology in the course(s). By far, the most popular tool to do the reflection was **Photo Story 3**, for over one-third of the respondents. Approximately two-thirds of the respondents took less than two hours in the preparation stage of the assignment. Almost half of the respondents took between one and two hours working with the technology to develop the product. In total, between two and four hours of the students' time was spent preparing to do the assignment and developing the finished product.

Very Positive	Positive	Neutral	Negative	Very Negative	Rating Average	Response Count
34% (16)	57.4% (27)	4.3% (2)	4.3% (2)	0% (0)	4.21	47

Clearly, with 43 out of 47 respondents rating the experience on reflecting on their learning using technology as either positive or very positive, incorporating technology into the reflection assignment was an engaging activity for almost 92% of the respondents.

Student Response	%	#
Yes, I recommend that this be a required assignment.	66	31
Yes, but I recommend that it be offered as an optional assignment for extra credit	27.7	13
No, I don't recommend doing this kind of assignment	6.4	3
I have no opinion on this questions	0	0

Almost 94% of the respondents would recommend that this kind of assignment be either required or offered as an optional assignment for extra credit. Two-thirds of the respondents recommended that the assignment be required.

The following are student comments on their experience of reflecting on their learning using technology.

- "I really enjoyed this last assignment because it was nice to reflect on everything I have learned. I especially liked it because my favorite thing we learned to do was to make a slide show."
- "It was really helpful to reflect on everything I had learned."
- "I've decided to use the diary entry method (loggel) because I currently keep a journal and feel it's the easiest way to explain myself and get my point across."

In general, the student reflections were descriptive in nature. Hatton and Smith (1995) differentiate descriptive writing from descriptive reflection. In descriptive writing, one just reports events or literature while in descriptive reflection, one provides reasons or justification for events or actions. Hatton and Smith go on to distinguish descriptive reflection from critical reflection. The critical reflector "demonstrates an awareness that actions and events are not only located in, and explicable by, reference to multiple perspectives but are located in, and influenced by, multiple historical, and socio-political contexts" (p. 18). Critical reflection leads to deeper understanding encouraging the reflector to question and challenge his underlying assumptions. (Yang, 2009).

Conclusion and Recommendations

This paper has briefly examined combining reflection and learning while using new technology tools. This has positive implications for instructors of online and hybrid courses. When learners are given the freedom to choose how to reframe, remix, relearn, and reflect on course content, more meaningful and engaging learning can occur. Just as reflection tends to be a personal process specific to the learner and the context, so too is the personal perspective with which the learner approaches the task of incorporating technology into the reflection process.

Appropriate incorporation of technology can make a valuable contribution to the learning of course content. "Technology affords possibilities and opportunities to play and explore" (Yelland, 1999, p. 41). As learners explore ways to transform content into meaningful learning, they build new understandings through these explorations. And as they build these new understandings through the production of their reflective pieces, instructors begin to look at learning through the

eyes of their students. For the instructor doing the reflection assignment midway through the course, this affords opportunities to look at the remaining weeks of the course, polish what seems to be working, and revise or throw out what students express is not working for them. An end-of-semester reflection assignment provides useful data for the instructor when planning future course content.

The students in both instructors' classes were not provided training in critical reflection; moreover, the series of questions provided in both instructors' reflection assignments did not specify that learners should articulate in depth, for example, on the learning outcomes. In future reflection/technology assignments, the instructors plan to use Ash and Clayton's (2004) three-phase reflection framework which incorporates description, analysis, and articulation of learning outcomes (p. 140). In the Articulating Learning (AL) model, the learner is asked to reflect on *the what*, *the so what*, and *the now what* by answering four guiding questions: (1) What did I learn? (2) How specifically did I learn it? (3) What does this learning matter or why is it significant? (4) In what ways will I use this learning, or what goals shall I set in accordance with what I have learned in order to improve myself, the quality of my learning, or the quality of my future experiences? (p. 142). In addition, a rubric for assessing the amount and depth of reflection will be used similar to that developed by Ray and Coulter (2008, p. 24).

As digital native 21st century learners and their immigrant instructors explore new ways to connect technology with meaningful learning in the reflection process, online educational experiences should be ones that are engaging, critical, creative, memorable, and transformative.

Bibliography

Ash, S.L., & Clayton, P.H. (2004). The articulated learning: An approach to guided reflection and assessment. *Innovative Higher Education*, *29*(2), 137-154.

Bartlett, L. (1990). Teacher development through reflective teaching. In Richards & Nunan (Eds.), *Second Language Teacher Education,* 202-214. Cambridge, UK: Cambridge University Press.

Bruner, J. S. (1960). *The process of education.* New York, NY: Vintage.

Bucciarelli, L. (2009). Teaching students to use their heads, hands, and hearts. *Learning & Leading with Technology*, *37*(3), 32.

Canning, C. (1991). What teachers say about reflection. *Educational Leadership*, *3*, 18-21.

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process*. Boston, MA: D.C. Heath.

Dewey, J. (1998). *Experience and education: The 60th anniversary edition*. West Lafayette, IN: Kappa Delta Pi.

Greenhow, C., Robelia, B, & Hughes, J. E. (2009). Learning, teaching, and scholarship in a digital age. *Educational Researcher*, *38* (4), 246-259.

Hatton, N, & Smith, D. (1995). Reflection in teacher education: Towards definition and implementation. *Teaching and Teacher Education*, *11*(1), 33-49.

Langer, E.J. (1997). *The power of mindful learning*. Reading, MA: Addison-Wesley.

Loughran, J.J. (1996). *Developing reflective practice: Learning about teaching and learning through modeling*. Washington, DC: Farmer Press.

Lowery, N. V. (2003). The fourth "R": reflection. *The Mathematics Educator*, *13*(2), 23-31.

Mezirow, J. & Associates. (1990). *Fostering critical reflection in adulthood: A guide to transformative and emancipatory learning*. San Francisco, CA: Jossey-Bass.

Nesbitt, B. (2007). *A vision of K-12 students today.* Video retrieved from http://www.youtube.com/watch?v=_A-ZVCjfWf8

Overby, A. (2009). The new conversation: Using weblogs for reflective practice in the studio art classroom. *Art Education*, *62*(4), 18-24.

Partnership for 21st Century Skills. (2009). *The MILE guide: Milestones for improving learning & education*. Retrieved from http://p21.org/documents/MILE_Guide_091101.pdf.

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, *9*(5), 1-6.

Ray, B. B., & Coulter, G. A. (2008). Reflective practice among language arts teachers: The use of weblogs. *Contemporary Issues in Technology and Technology Education*, *8*(1), 6-26.

Reed, A. J. S., & Bergemann, V. E. (2001). *A guide to observation, participation, and reflection in the classroom.* Boston, MA: McGraw Hill.

Rogers, R. R. (2001). Reflection in higher education: A concept analysis. *Innovative Higher Education*, *26*(1), 37-57.

Ross, D. D. (1989). First steps in developing a reflective approach. *Journal of Teacher Education*, *March-April*, 11-35.

Saltpeter, J. (2003). 21st century skills: Will our students be prepared? *Technology & Learning*, *24*(3), 17-18.

Schön, D. (1983). *The reflective practitioner: How professionals think in action*. New York, NY: Basic Books.

Sparks-Langer, G. M., & Colton, A. B. (1991). Synthesis of research on teachers' reflective thinking. *Educational Leadership*, *3*, 37-44.

Wesch, M. (2007) *Web 2.0…The machine is us/ing us*. Video retrieved from http://www.youtube.com/watch?v=6gmP4nk0EOE&feature=channel

Yang, S.H. (2009). Using blogs to enhance critical reflection and community of practice. *Educational Technology & Society*, *12*(2), 11-21.

Yelland, N. (1999). Reconceptualizing schooling with technology for the 21st century: Images and reflections. *Information Technology in Childhood Education*, *Annual 1999*, 39-59.

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Editor's Note: Web and video tools for learning at a distance have their own distinctive advantages. It could be predicted that replacement of a lecture with a recording of that lecture could not be better than the live performance, and might well be inferior because feedback, visual cues, and peer associations developed in the face-to-face situation were lacking in the recorded version. This study tests the validity of the recorded lecture without other means of student support.

Mode of Instructional Delivery and Student Performance in a Research Methods Class

Thomas K. Ross
USA

Abstract

This study examines the performance of on-line and classroom students in an undergraduate senior level research methods course where the only difference between the two groups was the mode of instructional delivery. Classroom students viewed live lectures and on-line students had access to a recorded version of the same lecture via the internet. Classroom performance was typically 5 to 10 points higher than the scores earned in the on-line section. The lower performance of on-line students was related to lower utilization of course content and the lower effectiveness of on-line recordings relative to live, classroom lectures.

Keywords: Asynchronous web based learning, asynchronous web (AW), attendance, face-to-face learning, GPA, instructional delivery modes, multiple regression, no significant difference, t-test.

Introduction

The drive to expand distance education is unstoppable. This drive is based on the desire to increase access to education for groups that cannot or do not want to utilize traditional education settings and maximize revenues of educational institutions. As educators, our task, regardless of whether knowledge or commerce is the primary driver, is to ensure the quality of education delivered. The growth of asynchronous web based learning (AW) has lead to a proliferation of studies examining whether AW is comparable to traditional classroom education.

Many hold there is "no significant difference" between AW and classroom delivery of content and an extensive website supports this contention, www.nosignificantdifference.org. Advocates of this view have taken a bold position:

The fact is that the findings of comparative studies are absolutely conclusive, one can bank on them. No matter how it is produced, how it is delivered, whether it is interactive, low tech or high tech, students learn equally well with each technology and learn as well as their on-campus, face-to-face counterparts (Russell, 2001, xviii).

Phipps and Merisotis (1999) reviewed a large number of studies that support this view and identified a host of methodological problems leading them to conclude the results are inconclusive and should be used with caution. The idea that the mode of instructional delivery has no impact on learning runs counter to Marshall McLuhan's famous dictum: the medium is the message. McLuhan noted the medium "shapes and controls the scale and form of human association and action" and has an impact independent of its content (McLuhan, 1964, p. 9).

Previous studies have both supported and rejected the "no significant difference" conclusion. A meta-analysis of 86 studies concluded that in two thirds of the cases AW students outperformed F2F (Shachar & Neumann, 2003). Multiple studies have documented lower retention rates (Phipps & Merisotis, 1999; Carr, 2001; McLaren, 2004) and lower scores in AW classes (Durden & Ellis, 1995; Brown & Liedholm, 2002). Ross and Bell (2007) analyzed course scores in a

quality management course and found F2F students' scores were statistically better than their AW counterparts and student performance was related to the number of on-line lectures viewed. That paper used the number of lectures viewed on-line to gauge students' investment in mastering course content and did not control for the amount of time spent on each lecture or classroom attendance.

Method

This study attempts to peer deeper into the education process and determine the cause(s) for the higher F2F performance. The measures of student investment in mastering course content used in this study are: the percent of total content viewed on-line and in-class. It is expected that students who are exposed to greater amounts of content will perform better than students with more limited exposure. The use of two measures provides the opportunity to determine if there are differences in student performance based on instructional delivery mode i.e. on-line or classroom.

A research methods course delivered in 2007 provides an appropriate case study because the only difference between the AW and F2F sections was the latter group was exposed to course content primarily in the classroom while the former viewed the recorded classroom lectures via the internet. The class was built on the Moodle course management system and all class lectures were recorded using Mediasite. Powerpoint slides were provided in Moodle to accompany the lectures. All students had access to these slides prior to the lectures and a common text was used. Both groups of students had complete discretion in how they obtained course content; they could attend class, view the class lectures on-line, or attend class and view the lectures on-line. Class attendance was not mandatory and was not used in evaluating student performance.

F2F and AW students had access to the same information and completed identical homework assignments and exams. Both sections completed exams on-line under the same constraints. The only difference between the two sections was how content was obtained thus the course provides an opportunity to examine how the mode of instructional delivery impacts student performance. The course began with 45 AW students and 31 F2F students. At the end-of-the semester, 69 students had completed all the assigned work.

Table 1
Descriptive Statistics

	AW	F2F
N	45	31
GPA	3.18 (0.47)	3.14 (0.31)
Age	27.6 (7.4)	20.9 (4.4)
% Female	80.0%	93.5%

Standard deviations shown in parentheses

Table 1 shows substantial differences in the students enrolled in each section. The AW section has a marginally higher GPA, is older, and has a smaller percentage of females. The differences in standard deviations are substantially larger than the means; the greater variation in AW group is expected given the goal of AW is to expand access to education to non-traditional students.

Figure 1 shows the grade distribution for overall course scores by instructional delivery mode. The distribution of overall scores has three distinct ranges, 85-94.9 (superior), 70-84.9 (average), and below 70 (substandard). At the highest end of the range, 13.4% of AW students scored above 85 versus 25.8% for F2F. Between 70.0 and 84.9 performance is comparable, 57.8% AW versus 61.3% F2F. The most striking difference occurs at the lower end of the distribution, 69.9 and below. Almost three in ten AW students (28.9%) earned less than 70% versus one in eight F2F students (12.9%).

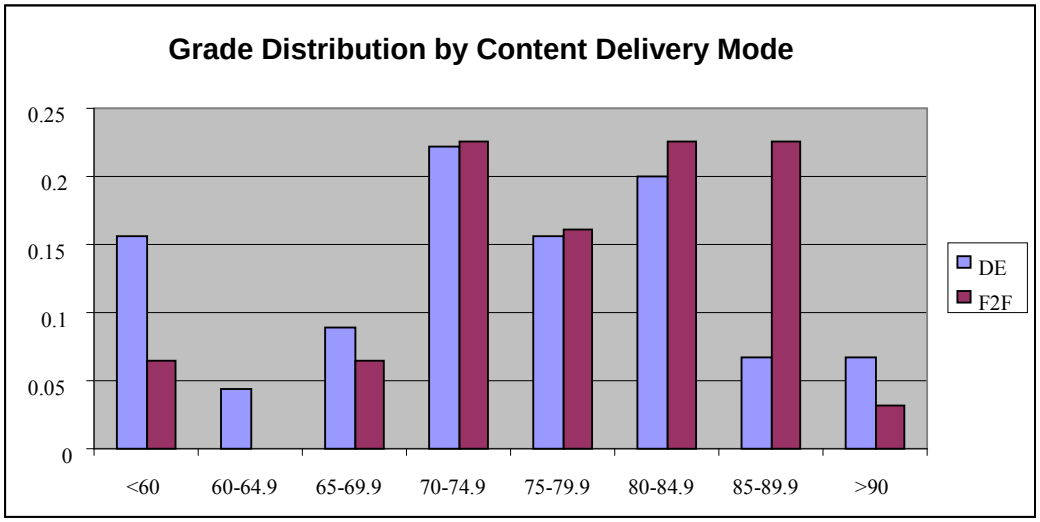

Figure 1 - Grade Distribution by Content Delivery Mode.

Focusing on a single, end-of-semester course score introduces an attrition problem, performance narrowed as the course progressed due to poorly performing students dropping the class and/or not submitting work. Subsequent analyses of overall course scores include all students enrolled in the class, scores for students who did not complete one or more assignments are based on points earned and points attempted. The analyses of the assignments comprising the overall score do not include students who did not submit the assignment so sample sizes vary.

Results

One tailed t-tests, table 2, were run to determine if F2F performance is statistically higher than AW performance. F2F scores were higher for each exercise and statistically higher on three of the five assignments as well as for the overall course score. Table 2 also shows performance was more consistent in the F2F section; variances in the F2F group are lower for each assignment and significantly lower than the AW group in four of six cases.

A primary difference between F2F and AW students is their utilization of course lectures. Figure 2 shows class attendance for F2F students and percent of lectures viewed on-line by AW students. This figure incorporates content viewed through the student's primary instructional delivery mode; it does not include content received in-class by AW students or viewed on-line by F2F students. In-class attendance tracking was limited to a sign-in sheet, students who arrived late were not included and students who signed in were considered present for the entire lecture. Mediasite calculates the percent of lecture viewed on-line and was unable to calculate viewing time in ten episodes (out of 1,144).

Table 2
Scores by Assignment

	AW	N	F2F	N	Difference	P
Overall Score	72.0 (235.0)	45	77.6 (122.8)	31	5.6 (-112.2)	0.03* (0.03)
Homework	66.5 (434.3)	45	76.2 (273.8)	31	9.8 (-160.5)	0.02 (0.09)
Test 1	69.3 (209.4)	43	77.5 (93.1)	31	8.2 (-116.3)	0.00* (0.01)
Test 2	74.7 (315.0)	44	80.2 (135.7)	30	5.5 (-179.3)	0.06* (0.01)
Research Paper	78.3 (183.1)	41	80.0 (181.4)	29	1.7 (-1.7)	0.31 (0.50)
Cumulative Final	71.3 (368.1)	43	76.9 (79.5)	30	5.6 (-288.6)	0.05* (0.00)

Variances shown in parentheses.
P: one tail assuming equal variance
*: one tail assuming unequal variance

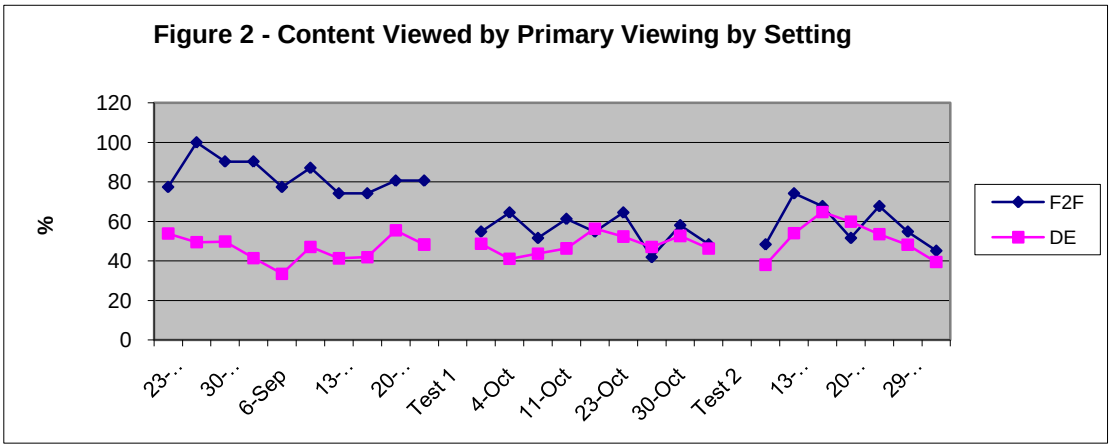

Figure 2. Content viewed by primary view setting.

Figure 2 shows F2F students viewed a larger percentage of course content, 66.1%, than their AW counterparts, 47.1%. There was no difference in variance and a t-test assuming equal variance determined the difference in content viewed was significant ($p = 0.001$). F2F students were exposed to a significantly larger percentage of course content than AW students.

Determinants of Performance

Previous studies used a multitude of variables to explain student performance encompassing academic measures; GPA, attendance, SAT scores, previous quantitative coursework, and credit hours completed and personal characteristics; age, race, gender, and income (Eskew & Fahey, 1988; Durden & Ellis, 1995; Wojciechowski & Bierlein Palmer, 2005). Part of the problem with

analyzing academic performance is many of the independent variables are collinear and it is impossible to determine individual impact in a multiple regression (Johnson, Johnson, & Buse, 1987). Attempting to understand the independent impacts of choice of instructional delivery mode, amount of content viewed, homework performance, and GPA on student scores is impossible given the interrelationships between these variables. Students with high GPAs are assumed to devote more time to their courses and were more diligent in completing homework assignments thus higher course performance should be expected. In addition, choice of delivery mode was correlated with content viewed.

Table 3 reports the multiple regression results when GPA, percent of content viewed on-line, and percent of content obtained in-class are used to predict student performance. When on-line viewing times could not be calculated the unknowns were replaced with the average viewing percent for the other lectures viewed by the student.

Table 3
Determinants of Student Performance

	Overall Course Score	Homework	Test 1	Test 2	Research Paper	Cumulative Final
Intercept	10.37 (0.28)	20.55 (0.16)	14.29 (0.15)	20.38 (0.13)	26.04 (0.02)	12.58 (0.30)
GPA	17.34 (0.00)	11.54 (0.02)	16.96 (0.00)	16.47 (0.00)	12.95 (0.00)	16.25 (0.00)
On-line %	0.13 (0.03)	0.20 (0.02)	0.03 (0.58)	0.05 (0.47)	0.11 (0.08)	0.13 (0.06)
In-Class %	0.18 (0.00)	0.27 (0.00)	0.12 (0.01)	0.11 (0.07)	0.13 (0.01)	0.18 (0.00)
Adj. R^2	0.42	0.24	0.36	0.19	0.24	0.31

P values in parentheses.

Discussion

Overall Course Score

GPA, on-line viewing, and in-class exposure to content are all positively and significantly related to the overall course score. The intercept is insignificant lessening the probability of an omitted variable problem and the adjusted R^2 shows that 42% of the change in student performance is explained by the independent variables. A 1.0 change in GPA translates into a 17.34 change in the predicted course score.

The results for GPA are similar to Brown and Liedholm (2002), student scores were predicted to increase by 12.72 to 15.93 for each one point increase in GPA. They used six independent variables and their explanatory power varied from 36% to 50%. Other studies of academic performance consistently find positive and statistically significant coefficients for GPA (Eskew & Faley, 1988; Durden & Ellis, 1995).

On-line viewing of content was positive and significant and predicts that a student viewing 100% of the on-line lectures would expect a course score 13 points higher than a student who did not access the lectures. In-class exposure to content was positive and significant and predicts for

every 1.0% of content viewed in-class, overall course score will increase by 0.18. A student attending all 26 lectures would expect to score 18 points more than a student who attended no classes. Comparing the predicted scores based on content viewed for the average on-line (48.1% on-line and 1.6% in-class) and average in-class (67.0% in-class and 7.7% on-line) student shows the AW student is expected to earn 6.5 points less than a F2F student based on lower exposure to course content and the lower effectiveness of on-line lectures.

Brown and Liedholm (2002) found similar tendencies in hours devoted to study and grades, 51% of their on-line group reported devoting less than three hours per week to study while in-class attendance averaged over 80%. Overall course grades were 4.40 points lower in the on-line section. Durden and Ellis (1995) found attendance measured as a number of absences to be significant ($p = 0.01$) but with a low impact on grade. When attendance was measured as a dichotomous variable, no effect was identified until five or more classes are missed. Measuring attendance as a dichotomous variable speaks to the effect of excessive absenteeism on student performance.

Homework

The homework intercept is insignificant yet shows more than 20% of the potential points on homework are due to non-captured variables. The intercept is the second largest calculated and may reflect the grading criterion of the instructor. Grades on homework assignments were based on effort and timely submission of work while test scores were primarily driven by arriving at the correct answers. The grading criteria on homework may explain why the coefficient on GPA is the lowest of the six tests, i.e. prior academic achievement is less important in determining homework scores. Both on-line viewing of content and in-class exposure to content were positively correlated with homework scores and statistically significant. The coefficient for on-line viewing, 0.20, is smaller than in-class exposure, 0.27, indicating that on-line students did not earn the same scores based on the same level of exposure to content. The higher coefficient for in-class exposure indicates student performance varies based on how course content is received.

Test 1, Test 2 and Cumulative Final Exam

Given the consistency of the testing coefficients, the exam coefficients are discussed as a group. The intercept coefficients are small (12.58-20.38) and none are significant. The coefficients on GPA are large, statistically significant, and stable ranging from 16.25 to 16.96. Each 1.0 increase in GPA predicts a 16 point increase in a student's exam score. On-line viewing of content was statistically insignificant for all tests and indicates on-line viewing had no impact on test scores.

In-class exposure to content was positive and statistically significant for two of three exams. A 12.0 point increase in score is predicted on test 1 for a student who attended the ten classes prior to the exam versus a student who attended no classes. Similarly a student who attended all classes prior to the final exam would be predicted to earn 18 points more than a student who attended no classes. The lack of significance for on-line viewing is interesting given the content delivered on-line and in-class was identical and only the mode of delivery changed. This finding suggests that the mode of instructional delivery has a significant impact on exam performance.

Research Paper

The coefficients for the research paper parallel those calculated for homework, the intercept is positive, large, and significant. GPA is positive and significant but smaller than the coefficients calculated for exams. The research paper and homework were different exercises than the exams as time limits on performance were relaxed. F and t tests showed there was no difference in the average scores or variances on the research paper. Multiple regression shows on-line viewing is unrelated to the research paper score while in-class exposure to content is correlated with higher scores. The lack of difference found for scores using the t-test between the two modes of delivery may be due to other non-captured variables. The intercept was significant and may account for

one or more variables that counterbalance the positive impact of in-class exposure to content. Another explanation for the lack of significance in the t-test is this assignment came late in the semester and compares those students most likely to successfully complete the course rather than those initially registered. The sample size for the research paper was 70, by this point in the semester four AW students and two F2F had withdrawn.

Smeaton and Keogh (1999) conducted a similar study on the effectiveness of on-line and in-class lectures and concluded there was no significant difference in end-of-course exam scores for a virtual class in 1997 and a traditional class in 1995. The authors also concluded "the amount of course taken does not correlate at all with exam performance" based on scores in the 1997 class. This conclusion begs the question: what value are the lectures if viewing or not viewing content does not impact grades?

This study finds a lecture delivered in the classroom is positively correlated with performance and the same lecture when recorded and viewed on-line is positive but insignificant. In-class students can expect to earn higher grades if they increase class attendance but AW students cannot expect to earn higher scores on tests or research papers if they view more content on-line. McLuhan (1964) held the medium could amplify or diminish the message; in this case the medium may be negatively affecting student behavior and producing lower performance.

Why should we expect differences in the quantity and quality of on-line study and/or instruction?

Comparing a live lecture to its recorded counterpart, it is clear why AW instruction is not comparable to classroom instruction. The live performance is shared, immediate, involves multi-channel, two-way communication that places the audience in a vulnerable position and the speaker controls the amount of material delivered and the environment.

One of the greatest obstacles for recorded lectures may be the audiences' prior experience and expectation for recorded material. Students in industrialized countries have been raised on high production value television programming, the low production value of academic lectures may not be able to capture and hold the audiences' attention. Academic lectures lack most of the features that television and movies employ to hold an audiences' attention; academic lectures generally have no musical cues, laugh tracks, or zoom capability and are built on poor visuals, a single, fixed camera position, and slow pacing. The low production values of academic lectures may produce the same outcome as poor television, the audience changes the channel or goes to sleep.

The sage on a stage approach may work in classrooms because of students' different expectations for live performance. The classroom creates unity of purpose among the audience, regulates the amount of content delivered, and reduces distractions. Classrooms offer students the ability to observe and model the behavior of other students whereas on-line learning is mainly a solitary task. Students can observe their classmates to determine if others are "getting" the material and use this information to seek immediate (during class) or postponed (after class) clarification. When one's attention begins to wane, the knowledge that others are simultaneously experiencing the same event may make the experience more bearable.

On-line recordings require students to self-direct their learning. On the positive side, the student can choose the time and place which is most convenient, on the negative side their choices may involve listening to lectures while attempting to multi-task. The on-line learner is responsible for regulating the amount of content covered at a particular time and distractions. Mediasite statistics demonstrate on-line users often do not listen to entire lectures and consume the parts they listen to in small increments. The advantage of the classroom is the instructor regulates how much time will be spent and the lecture is consumed at a single sitting. Social convention works against students walking out of class so one of the prime differences between distance and traditional

education revolves around the desirability of piece-meal and often incomplete consumption of content versus all-at-once classroom consumption.

The live lecture is immediate and has a "capture it or lose it" quality that should enhance attention; on the other hand the AW lecture can be rewound and replayed fostering a mindset of "if I don't get it the first time, I can play it again". Communication in the classroom is immediate, multi-channel and bi-directional. The classroom offers students the opportunity to ask questions and receive immediate clarification from the instructor. On-line students can submit questions but this often entails a less-than-prompt response. The classroom instructor also observes the facial expressions and body movements of students to determine if they understand the material and decides to alter the pace of the lecture or repeat material based as they see fit.

The audience in a live performance is more at risk and may be inclined to pay greater attention. The classroom offers the threat that inattentive students will miss information and may be called upon to answer a question. Common courtesy encourages most students to at least pretend to be interested in a live speaker as well as stay for the duration of the remarks. AW statistics again show that on-line students do not view entire lectures and the amount of attention they give to the lecture cannot be assessed.

The differences between on-line and classroom delivery of content, the ability to start/stop/repeat a lecture, e-mail an instructor a question without exposing oneself to the ridicule of fellow students, learn in solitary environment, and self determine the amount of content covered at a particular time may be advantages for some students. Grow (1991) categorizes students from dependent, those that should be in a classroom, to self-directed, those that thrive in on-line environments. Self-directed students have the ability to set their own goals, time and project management skills, and are capable of self evaluation.

This study has demonstrated the difference in performance between AW and F2F students is partly based on self-direction, choosing to bypass course material, and the lower effectiveness of on-line lectures. The negative impact of these two factors can be overcome by self-directed students. In this case, the disadvantages of AW can be overcome by: high incoming GPAs, more diligent use of on-line lectures, and/or attending in-class lectures. In this class if AW students had increased the amount of content viewed to the F2F average, the overall course grade gap between AW and F2F students would shrink from 5.6 to 3.1 points.

One drawback of a natural experiment is self-selection. This study does not meet the standards of a random control study where the only difference between groups is the intervention since subjects have no control over which group they are assigned. While random assignment increases confidence that the intervention was the cause of any change observed (versus some underlying difference in the groups), the natural experiment may increase confidence in the generalizability of the findings. This study shows that AW is a less effective mode of instruction given the type of student that chooses on-line education. Another weakness of the study is omitted variables. Multiple regression analyses were ran using three independent variables. Other studies of academic performance used more predictors including standardized test scores, credit hours completed, age, race, gender, and income among others.

Conclusion

F2F students performed better than their AW counterparts in a research methods class when the primary mode of instructional delivery was classroom lectures for the in-class students and the same lectures recorded and viewable over the internet for the on-line section. F2F performance was typically 5 to 10 points higher than the scores earned in the AW section. The lower performance of AW students was related to lower utilization of course content and the lower effectiveness of on-line recordings relative to classroom lectures. This study demonstrated for

this subject that mode of instructional delivery and the types of students that select F2F and AW instruction F2F students outperformed their AW counterparts.

The results are not generalizable to all forms of AW but they disprove the contention of "no significant difference". An exhaustive study of the difference between AW and the classroom would have to control for a multitude of variables; the subject, the method of AW delivery, how performance is measured and student characteristics among other variables. The subject of the effectiveness of AW versus the classroom will never be settled as long as unmeasured variables can be identified; in this case did the mode of delivery or unmeasured students factors produce the lower AW scores? The study showed that the AW students devoted less time to acquiring course content than their F2F counterparts, was this due to how content was delivered or the AW student? It seems reasonable to conclude that how content is delivered matters and the degree to which it matters varies by individual.

In this course the majority of students produced similar scores whether they were on-line or in-class but AW presents additional challenges not faced by F2F students as evidenced by poorer performance and higher drop-out rates in the AW section. AW may present large obstacles for students with poor academic skills. As educators we must do a better job of "selling" AW programs so at-risk students will understand the challenges they will face and provide advising services that guide students into the academic setting where they are more likely to succeed and when guidance fails, we must provide support services to overcome the additional challenges of AW learning.

References:

Brown, B. W., & Liedholm C. E. (2002). *Can Web Courses Replace the Classroom in Principles of Microeconomics?* American Economics Review, 92(2), 444-448.

Carr, S. (2000). *As Distance Education Comes of Age, the Challenge Is Keeping the Students.* Chronicle of Higher Education, 46(23), A39-A41.

Durden, G. C., & Ellis, L. V. (1995). *The Effects of Attendance on Student Learning in Principles of Economics.* American Economic Review, 85(2), 343-346.

Eskew, R. K., & Faley, R. H. (1988). *Some Determinants of Student Performance in the First College-Level Financial Accounting Course, The Accounting Review*, LXIII(1): 137-147.

Grow, G. O. (1991). *Teaching Learners To Be Self-Directed. Adult Education Quarterly*, 41, 125-149.

Johnson, A. C., Johnson M. B., and Buse, R. C. (1987). *Econometrics.* New York: MacMillian Publishing Co.

McLaren C. H. (2004). *A Comparison of Student Persistence and Performance in Online and Classroom Business Statistics Experiences*. Decision Sciences Journal of Innovative Education, 2(1), 1–10.

McLuhan, M. (1964). *Understanding Media*, New York: McGraw-Hill.

Phipps, R., and Merisotis, J. (1999). *What's the Difference? A Review of Contemporary Research on the Effectiveness of Distance Learning in Higher Education*, Washington DC: Institute for Higher Education Policy.

Ross, T. K., and Bell, P. D. (2007). *"No Significant Difference" Only on the Surface, International Journal of Instructional Technology and Distance Learning*, 4(7). Retrieved August 18, 2008 from http://www.itdl.org/Journal/Jul_07/article01.htm.

Russell, T. L. (2001). *The No Significant Difference Phenomenon*, International Distance Education Certification Center.

Shachar, M., and Neumann, Y. (2003). Differences between Traditional Education Academic Performance: A Meta-analytic Approach. *The International Review of Research in Open and Distance Learning*, 4(2). Retrieved August 18, 2008 from http://www.irrodl.org/content/v4.2/shachar-neumann.html

Smeaton, A., and Keogh, G. (1999). An Analysis of the Use of Virtual Delivery of Undergraduate Lectures. *Computers and Education,* 32, 83-94.

Wojciechowski, A., and Bierlein Palmer, L. (2005). Individual Student Characteristics: Can Any Be Predictors of Success in Online Classes? *Online Journal of Distance Learning Administration*, 8(2). Retrieved August 18, 2008 from http://www.westga.edu/~distance/ojdla/.

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