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Donald G. Perrin, Executive Editor

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Editorial

Triage in the Virtual Classroom

Don Perrin

Triage is a process used in emergencies to maximize the effectiveness of response teams. In extreme cases it separates the living from the dying, and assigns rescue workers and medical help to save the largest numbers of people. This is a frightening analogy to use for learning environments, but the same decision conflicts arise for teachers and how they relate to learner needs. Are there enough resources for everyone to be treated equally? If equal means the same treatment for every student, we make decisions for the group as a whole. This is counter-productive for individuals with special needs, and inefficient for those whose needs differ from the majority. If we focus on individual needs, we do not have enough time and resources to support all class members. This is where the triage concept comes in. How can we apply our finite (and often limited) resources to maximize learning?

The industrial revolution gave us the batch processing model used in classroom learning. It is based on delivery of knowledge by the teacher through lectures and discussions. Many teachers feel they have achieved their objectives if they "cover" the entire curriculum. More recently, emphasis has moved to performance on standardized tests. Let us call this kind of classroom an "information delivery system." The emphasis is on content delivery and test taking. In the first half of the twentieth century this kind of learning was improved by presentation technologies such as films, filmstrips, recordings, radio, and television.

In the second half of the twentieth century communication technologies became individual and interactive as in the language lab, teaching machines, interactive multimedia, computer-based learning, interactive television, the internet, and cell phone. Initially these were cost prohibitive, but over time they became inexpensive, plentiful and ubiquitous.

For a long time the folk culture of education resisted technology. The new millennium was ushered in with computers, cell phones, internet, and distance learning embedded in education and training across the globe. Social changes were underway to "flatten" the world economy and "outsource" production and services to the lowest bidder. There was less opportunity for low performing learners and "graduates" of poorly performing schools. Global standards replaced local competition with new global competitors. Educational systems in previously industrialized countries found nations such as China and India were now major competitors. Triage became necessary to repair failing systems of education in nations that were once leaders.

Learning management system (LMS) technology is endemic to distance learning. Many LMSs have tools to enable "triage" by rapid identification of learner needs. The same technology provides interactive learner-specific solutions, monitors progress, and balances the needs of individual learners against available resources and needs of other learners.

LMS technology sets the "instructor" free to guide and manage the learning process, diagnose and prescribe solutions beyond the limits of the LMS, and provide individual tutoring where needed. The computer and the internet make LMS resources available anywhere and anytime. They are a logical alternative to traditional classroom education.

Just as we have new leaders in the world economy, we need leaders and innovators in teacher training to enable today's teachers to catch up and pass their technology savvy students. We need to reorient educational systems to develop "minds", not "hands". We need to develop learners who are entrepreneurial, innovative, creative, efficient, and excellent communicators. Good education solutions are needed to avoid triage in national job markets and national economies.

Editor's Note: This is a substantive paper that clearly delineates between teacher and student, doctor and patient, novelist and reader. Perhaps the validity of learning is not in distance or immediacy but in the construct of instructional design and teaching appropriate to the technology.

University Faculty Expressions of Computer Self-Efficacy and Personal Attitudes Regarding the Viability of Distance Learning

Larry S. Tinnerman

USA

Abstract

Studies have shown that there is a direct link between a teacher's attitude towards self-efficacy and effectiveness. Further studies have refined this idea of how expressions of computer self-efficacy impacts upon attitudes regarding the use of technology in the classroom and by inference, the effectiveness of such technology. The purpose of this mixed method design study was to examine the impact that such attitudes can have upon faculty teaching at institutions of higher education as they relate to distance learning programs. This study examined 98 education faculty volunteer participants at five Pennsylvania State Systems of Higher Education Universities. Based upon responses to a survey, participants were assigned to one of three groups: low self-efficacy, high self-efficacy and high proficiency. The pool of participants was divided into two groups: have taught distance learning classes or have not taught distance learning classes. Quantitative analysis in the form of t-test analysis of the have taught and have not taught groups was performed and found significant differences between the groups at $p<.05$ regarding self-expressed attitudes of computer and technological self-efficacy. A one-way ANOVA analysis of variance was performed using the low efficacy, high efficacy and high proficiency groups and found significant differences between the groups at $p<.05$ regarding acceptance attitudes of distance learning programs and attitudes towards the hiring of faculty who have matriculated from graduate level distance education programs. Follow-up interview were conducted with 12 survey respondents who volunteered to participate. The interviews revealed varying levels of confidence and mistrust of distance learning programs. The vast majority of the interview respondents indicated a reluctance to consider distance learning graduates for faculty positions.

The Problem

Research has shown that the individual attitudes of faculty members in regards to technological self-efficacy and competence can have an effect upon their view regarding the effectiveness of distance learning programs (Gist et al., 1992). The main concern of my study is an analysis of how these attitudes impact upon faculty and administrative decisions regarding the hiring of distance education graduates as faculty in departments of higher education. With so many public and private universities offering graduate degrees via distance learning, an issue needing further examination is the acceptance of these degrees by the higher education job market. At the same time, many in higher education are more accepting of distance education as a means of course delivery (Codeway, 1986, Brown, 2000, Gist et al., 1992), are these more tolerant attitudes being carried over into making pragmatic hiring decisions regarding faculty applicants? Research studies such as this can begin to examine the possibility that a dual nature exists in higher educators' attitudes towards distance learning. Attitudes vary greatly from opinions of course deliver effectiveness to the more pragmatic recognition of the hiring of graduates of such programs in one's own department.

Importance and Relevance of this Study

As education enters into the 21st century, the need for university accessibility for potential students continues to increase. The demographics of the average college students are also changing with many delaying university goals until later in life. The traditional campus environment may not be easily accessible to these students due to job, family and personal commitments. At the same time the cost of maintaining educational resources is also on the rise. The competitive need for highly trained individuals, particularly in the area of education, is expanding at an alarming rate. Many universities are turning to distance learning as a means to meet this need. This is, in part, due to the emphasis that a new global community places on highly trained individuals.

Education and training via the World Wide Web continue to grow rapidly due to, among other things, the reduced cost of world-wide accessibility, and improved technological capabilities which make electronic instructional delivery a viable alternative to classroom instruction.

While attempts have been made to measure the relative effectiveness of such programs, the problem is often like comparing apples and oranges. It is confusing to make cross comparisons between these two educational approaches. “There are many ways we can examine differences between distance education and face to face instruction, but using the idea of no significant difference is probably a misdirected approach” (Shearer, 2002, p.1).

The problems and questions that are presented in this new format for education can be broken down into three basic categories. First, are the two formats (the traditional classroom approach and the distance learning approach to teaching) equitable? Numerous studies such as “No Significant Difference” (Shearer, 2002, p.1) indicate that the two approaches are equivalent, with a few studies indicating that distance learning may actually be superior to traditional classroom instruction. However, when comparing outcomes, the researches in these studies have historically concentrated on standardized test performance rather than the assessment of higher level thinking abilities and actual job skills (Shearer, 2002). Another issue that is often overlooked concerns the fact that individuals enrolling in distance education programs are often self motivated individuals who may do well in any educational setting (Brown, 2000).

A second area that has been studied involves the attitudes of both students and instructors in regards to the distance learning model. In the beginning, many faculty members were found to be resistant to distance learning, often viewing it at nothing more than an upscale version of a correspondence course (Shearer, 2002). As more universities adopted the distance educational model, studies found that more university faculty expressed a more positive attitude to distance learning (Coldeway, 1986).

According to Social Learning Theory, as illustrated by Albert Bandura (1977, 1986, 1997), teachers and educators tend to utilize techniques, pedagogy and tools with which they possess a comfortable level of self-efficacy. In terms of the expanding role of technology, it is only logical to assume that some current faculty members feel overwhelmed. University faculty must be not only experts in the content area for which they are hired, but also possess an ever expanding degree of technical expertise as well.

Feelings of inefficacy may translate into resistance to change and actually may impact upon the development and deployment of distance learning programs. It is hoped that this study will add light to the causes of resistant attitudes so that universities may develop plans of action that include increased professional development opportunities and the possible development of technological standards for those faculty asked to teach in this technologically rich environment.

The General Problem under Investigation

Is there a significant difference between education faculty expressing high vs. low levels of technological self-efficacy and/or competence in regards to personal attitudes as to both the efficacy and the viability of graduate level distance learning programs in preparing future education faculty at America's institutions of higher learning? If institutions are granting a greater number of graduate degrees at a distance and yet, at the same time, the faculty in these programs are unwilling to consider these graduates for faculty positions in their departments, there appears to be a "disconnect" between practice and policy. This disconnection can lead to significant ethical questions.

Research Questions

1. Are faculty members who possess higher levels of technological levels of self-efficacy and proficiency more likely to embrace distance education than those faculty members who possess lower levels of technological levels of self-efficacy and proficiency? The null hypothesis for this question would contend that faculty members who possess higher levels of technological levels of self-efficacy and proficiency would not significantly embrace distance education more than faculty members who possess lower levels of technological levels of self-efficacy and proficiency.
2. Do faculty members who have taught courses on-line express a greater sense of self-efficacy in regard to the use of technology than do their traditional colleagues who teach only using traditional classroom based instruction? The null hypothesis for this question would contend that faculty members who have taught courses on-line would not express a significantly greater sense of self-efficacy in regard to the use of technology than do their traditional colleagues who teach only using traditional classroom based instruction.
3. Do members of the education faculty who possess higher levels of technological self-efficacy and proficiency significantly differ in their attitudes towards the hiring of on-line degree graduates for tenured track positions than do their colleagues? The null hypothesis for this question would contend that members of the education faculty who possess higher levels of technological self-efficacy and proficiency would not significantly differ in their attitudes towards the hiring of on-line degree graduates for tenured track positions than do their colleagues

Assumptions

1. Faculty members participating in the survey answered questions honestly and openly under the condition of anonymity.
2. Faculty member choosing to participate in the study were representative of the faculty at whole for the various sites utilized.
3. The faculty participants in this study had no vested interest in the outcome of the study.

Limitations

1. The willingness of participants to take part, to respond honestly and accurately, and to complete the survey in a timely manner that allows all completed surveys to be considered in the study.
2. Personal follow-up interviews will be conducted with 10% - 15% of the survey respondents. A limitation of the study involves the willingness of the faculty to participate and to respond honestly.
3. A final limitation of this study is tied to the fact that it is conducted utilizing only 5 member schools of the Pennsylvania's State System of Higher Education with a target sample size of 100 faculty members which may or may not be adequate for generalization.

The Design

Characteristics of the Defined Population

The participants for this study will consist of education faculty at one of five Pennsylvania State Systems of Higher Education Universities (Edinboro University of PA, Clarion University of PA, Shippensburg University of PA, Slippery Rock University of PA, and California University of PA.) Each of these public universities has a strong education program and each university also offers graduate degrees in education on-line.

The setting and sample are appropriate for this study because the respondents represent a cross section of faculty found at public universities in Pennsylvania. Each of the universities selected conduct classes and degree programs in education in both the traditional and distance learning model. Education faculty teaching arts programs such as music and art, plus physical education faculty were not included in this study due to the fact that distance education would not lend itself as an effective tool in such programs of study.

Participants Selection Process

Education faculty teaching at the university sites were each sent an email requesting their voluntary participation in an online survey administered by Student Voice Inc., a contracted service agency which oversees data collection for various educational institutions. Those choosing to participate did so by self-selection by completing the survey instrument. In addition, 50 faculty members who had not responded to the initial email were randomly selected to receive an invitation to complete a paper and pencil survey so as to include participation from those faculty members who may not be as comfortable with computer access.

Participant Target Number

Member university faculty – 20 education faculty for each of the 5 target universities

Total anticipated population – 100 education faculty members – Actual sample achieved 98

Research Methodology

(Quantitative) Survey

Online survey collection will be administered by StudentVoice Inc. The survey will be comprised of 22 Likert scale questions plus 10 demographic questions. The questions will be divided in the following groupings:

- Faculty self-reported level of expertise in using distance educational technologies (G1). (5 questions)
- Faculty expressions of self-efficacy in regards to educational technology. (G2). (5 Questions)
- Faculty personal attitudes in regards to the evolution of educational technology (G3). (3 questions)
- Faculty attitudes of equity of the distance learning model (G4). (4 Questions)
- Faculty attitudes towards the hiring of distance education graduates as members of education faculty at public universities (G5). (5 questions)

Data Instruments

Survey data was adapted from Elizabeth Gilmore's (1998) dissertation *Impact of Training on the Information Technology Attitudes of University Faculty*. The survey instrument, *Faculty Attitudes Toward Information Technology* (FAIT), assessed university and college faculty attitudes toward

new information technologies. Three separate pilot surveys were administered to assess the impact of the adaptations upon internal consistency. Each section of the survey using the final pilot data obtained a Cronbach's alpha of between .85 and .96 and is therefore considered to be internally consistent.

Potential Threats to Internal Validity

1. **Mortality** - As all faculty members' participation if voluntary, there was no way to guarantee that all participants would complete the survey and volunteer for the subsequent follow-up interviews.
2. **Testing** – The survey instrument used is administered both on-line and by paper and pencil. There is no formal measure as to inconsistencies in validity based upon administration protocol.
3. **Experimenter Effect** –
    a. Observer bias – as the research is conducting the qualitative interview process, and has had experience in distance learning environments, it can not be ruled out that the interpretation of the narrative data may be subject to some observer bias; however, each interview will be quantified using prescribed qualitative measures to keep such bias at a minimum.
    b. Hawthorne Effect – As the interview will be part of a total dissertation project, faculty members, hoping to be helpful may try to be "helpful" in the process in terms of their responses; however, this will be minimized by avoiding the discussion of the specific details of the project with the perspective interview participants prior to the study.

Generalizability of this study to other Sites/Subjects

While this study is specifically restricted to five public universities in Pennsylvania, it is believed that certain aspects of this study will generalize to other sites and similar subjects. To be sure, individual institutional attitudes towards distance learning instructional methods will have a wide impact on the staff perceptions of the efficacy of the distance learning educational mode of delivery. However, certain pervasive points should emerge, especially in the areas of perceived effectiveness and potential higher educational employability.

Basic advantages, obstacles and/or barriers to the distance educational idiom can be kept in mind by instructors when designing future criteria to either maximize or minimize their impact through creative use of instructional methodologies. This study can be used as a tool in conjunction with other like investigations through other instructional venues in order to provide a cross comparison of similarities and differences. In particular, this research should help in the planning and construction of future on-line programs offered by universities at the graduate level while at the same time, keeping in mind the limitations that may exist in regards to personal attitudes toward the hiring of program graduates.

Findings

The purpose of this study was to examine the impact of education faculty attitudes regarding self-reported computer/technology self-efficacy and/or competence that influence their attitudes regarding viability of graduate level distance learning programs. Secondly, the researcher examined the impact of these personal attitudes upon recommendations regarding hiring of new education faculty members who received advanced degrees from distance learning programs.

Overview of Procedures

The methods of analysis included independent *t-test* analyses of the questionnaire data comparing the attitudes of those faculty who have taught distance education classes as compared to those who have not. Analyses were performed at the p=.05 level of significance. Two one-way ANOVA tests were conducted which calculated the differences in faculty attitudes towards distance education and the hiring of distance education graduates broken down into three self-efficacy categories: high proficiency, high efficacy and low efficacy. It must be noted that the high proficiency group is a subgroup of the high efficacy group and is differentiated by the expressed skill level of responded in regards to utilizing more advanced computer applications other than basic email, word processing and PowerPoint.

Dates of Survey Data Collection – February 27, 2007 – March 12, 2007

Sample size: N=98 education faculty from 5 Pennsylvania PSSHE universities (See Table 3 for distributions). The total sample included faculty teaching in departments of education. Performance based, art education and physical education faculty were not included since their particular programs are not well suited for distance learning. StudentVoice® Inc., a university contracted private data collection agency oversaw the on-line survey instrument.

Email invitations were sent to 323 faculty members at the participating institutions. Responses were tracked by StudentVoice® Inc. and two follow-up invitations were also sent at two week intervals. Additionally, invitations and paper surveys were sent to 50 faculty members who failed to respond to the email request. The response consisted of 70 on-line respondents and 28 paper respondents. Each participating faculty member was given a chance to volunteer to participate in a follow-up interview with the anticipation of selecting between 10 and 15 based upon their efficacy rating. Of the 35 participants who volunteered, 15 were with 7 falling within the low efficacy group and 8 within the high efficacy group.

When examining the quantitative data from the survey it is important to note that the concept of technological self-efficacy is measured in two domains. The first domain refers to a level of self reported proficiency for tasks that go beyond just creating a PowerPoint or sending an email. These proficiencies referred to the actual ability as rated by the four point Likert scale of 1 = I cannot do this, 2 = I can do this with help, 3 = I can do this independently and 4 = I can teach others to do this in tasks that would typically be expected of faculty members teaching an on-line course For this study, the group was divided in half with those achieving an average score of 2.5 and above in the High proficiency group and those scoring less than 2.5 in the low proficiency group. The same process was utilized in establishing a rating of technological self-efficacy with each participant rating technology attitudes on a Likert scale of 1 = I Strongly Disagree, 2 = I Disagree, 3 = I Agree and 4 = I Strongly Agree. Again, for this study, the group was divided in half with those achieving an average score of 2.5 and above in the high self-efficacy group and those scoring less than 2.5 in the low Self-efficacy group. With these groups established, each group of 5 questions was divided into three categories:

1. Attitudes towards technology in education
2. Attitudes towards the efficacy of distance learning program technology
3. Attitudes towards the hiring of distance learning graduates for faculty positions in Higher Education.

Descriptive Statistics

Table 4 presents the descriptive and demographic makeup of all the participants. The categories consist of site, educational background, age, gender, years of university teaching, levels of distance learning classes taught, instructional status, tenure status and academic department

within the School/College of Education. In regards to the high proficiency group, 30 out of 42 have taught some level of distance learning class as compared with 14 out of 56 in the low proficiency group. In regards to the high self-efficacy group, 42 out of 65 have taught some level of distance learning class as compared to 2 out of 33 in the low proficiency group. Of the demographic data presented, the only category that demonstrated a significant difference at $p \leq .05$ between the High and Low grouping of both proficiency and self-efficacy was found between those individuals who have had experience in teaching distance education classes.

Table 4

Descriptive Characteristics and Demographics Statistics of Sample

		Frequency	Percent
Sites	Slippery Rock	19	19.4
	Shippensburg	22	22.4
	Clarion	19	19.4
	California	16	16.3
	Edinboro	22	22.4
Educational Background			
	Masters	7	7.1
	Terminal	91	92.9
Age Range			
	30 - 34	1	1.0
	35 - 39	9	9.2
	40 - 44	11	11.2
	45 - 49	15	15.3
	50 - 54	27	27.6
	55 and over	35	35.7
Gender			
	Male	26	26.5
	Female	72	73.5
University Teaching			
	Less than a year	1	1.0
	1 - 3 years	3	3.1
	4 - 6 years	21	21.4
	7 - 9 years	15	15.3
	10 or more years	58	59.2
DL Courses Taught			
	Graduate Level	28	28.6
	Undergraduate Level	6	6.1
	Both	10	10.2
	Never taught DL classes	54	55.1
Instructional Status			
	Full Time	96	98.0
	Part time	2	2.0
Tenure Status			
	Tenured	64	65.3
	Tenure Track	29	29.6
	Non-Tenure Track	5	5.1
Academic Department			
	Professional Studies	11	11.2
	ELED	23	23.5
	Early Childhood	2	2.0
	Reading	12	12.2
	Secondary Education	10	10.2
	Special Education	21	21.4
	School Psychology	1	1.0
	Other	17	17.3
	Total	97	99.0
	Missing	1	1.0

N=98

Tables 5 through 9 present the proficiency questions and the distribution of responses with Table 10 presenting participant grouping with 42 respondents in the high proficiency grouping and 56 respondents in the low proficiency grouping. Tables 11 though 13 present the self-efficacy questions and the distribution of participant responses. Table 14 presents a breakdown of participant grouping with 65 of the respondents falling into the high self-efficacy group and 33 respondents in the low self-efficacy grouping.

Table 5

Descriptive Statistics- Technological Proficiency – Design a Webpage with Embedded Links

	Frequency	Percent
I cannot do this	38	38.8
I could do this with assistance	39	39.8
I can do this on my own	6	6.1
I can teach others to do this	15	15.3
Total	98	100.0

Table 6

Descriptive Statistics- Technological Proficiency – Save PowerPoint Presentations as WebPages

	Frequency	Percent
I cannot do this	22	22.4
I could do this with assistance	48	49.0
I can do this on my own	16	16.3
I can teach others to do this	12	12.2
Total	98	100.0

Table 7

Descriptive Statistics- Technological Proficiency – Create On-line Course Components for On-line Shells Such as WebCT®, BlackBoard®, e-College®, etc.

	Frequency	Percent
I cannot do this	20	20.4
I could do this with assistance	26	26.5
I can do this on my own	25	25.5
I can teach others to do this	27	27.6
Total	98	100.0

Table 8

Descriptive Statistics- Technological Proficiency – Create an email distribution list

	Frequency	Percent
I cannot do this	15	15.3
I could do this with assistance	28	28.6
I can do this on my own	25	25.5
I can teach others to do this	30	30.6
Total	98	100.0

Table 9

Descriptive Statistics- Technological Proficiency – Create an Adobe PDF file

	Frequency	Percent
I cannot do this	19	19.4
I could do this with assistance	48	49.0
I can do this on my own	14	14.3
I can teach others to do this	17	17.3
Total	98	100.0

Table 10

Descriptive Statistics- Proficiency Groupings

	Frequency	Percent
High Proficiency	42	42.9
Low Proficiency	56	57.1
Total	98	100.0

Table 11

Descriptive Statistics- Technological Self-efficacy – I use computer technology regularly in my classroom instruction

	Frequency	Percent
I strongly disagree	14	14.3
I disagree	12	12.2
I agree	26	26.5
I strongly agree	46	46.9
Total	98	100.0

Table 12

Descriptive Statistics- Technological Self-efficacy – Computers in the classroom have helped me improve my teaching

	Frequency	Percent
I strongly disagree	11	11.2
I disagree	21	21.4
I agree	26	26.5
I strongly agree	40	40.8
Total	98	100.0

Table 13

Descriptive Statistics- Technological Self-efficacy – I feel prepared to instruct my students on how to successfully implement meaningful technology usage into their instructional pedagogy

	Frequency	Percent
I strongly disagree	11	11.2
I disagree	35	35.7
I agree	29	29.6
I strongly agree	23	23.5
Total	98	100.0

Table 14

Descriptive Statistics- Self Efficacy Groupings

	Frequency	Percent
High Efficacy	65	66.3
Low Efficacy	33	33.7
Total	98	100.0

Analysis

The *t-test* presentations are presented in two separate categories: Have taught distance education versus have only taught in a traditional classroom setting. The two one-way ANOVA tests were calculated by using three groups; high proficiency/high efficacy, low proficiency/high efficacy, and low efficacy. The questions in the ANOVA tests deal with faculty attitudes regarding (1) distance education as a viable method of course delivery and (2) the hiring of distance education program graduates (from recognized and accredited universities) for faculty positions in higher education.

Independent t-test Analysis

This section, an analysis of data for the research question two: *Do faculty members who have taught courses on-line express a greater sense of self-efficacy in regard to the use of technology than do their traditional colleagues who teach only using traditional classroom based instruction,* was conducted. An Independent Samples *t-test* was employed to test the null hypothesis for questions Q7, Q8, Q9, Q11, Q12, and Q13 which dealt with self reported faculty attitudes towards technology in general.

Table 15

A t-test Comparison of faculty who have taught distance learning courses with those who have not

		df	N	Mean	SD	t	p
Q7. I like using computers.	Taught	96	44	3.64	0.65	7.30***	0.000
	Not		54	2.98	0.78		
Q8. Computers in classroom help teaching.	Taught	92	44	3.64	0.65	4.42***	0.000
	Not		54	2.43	0.98		
Q9. I feel threatened by technology. [a]	Taught	96	44	2.77	1.05	2.01*	0.047
	Not		54	2.39	0.83		
Q11.Technology is a gimmick in education. [a]	Taught	96	44	2.80	0.77	1.54	0.128
	Not		54	2.57	0.66		
Q12.Students receive richer Experience w/technology	Taught	96	44	3.14	0.70	3.27**	0.001
	Not		54	2.63	0.81		
Q13. I assign more intense papers with WWW	Taught	70	44	2.93	0.90	4.40*	0.025
	Not		54	2.57	0.57		

Note: [a] Q9 and Q11 have been inversely coded due to the fact that the questions were phrased in a negative manner. A higher mean score indicates a more favorable attitude towards the use of technology.*p<.05. **p<.01. ***p<.001.

When examining Q7: "I like to using computers", an independent samples *t-test* analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have not (not taught) was found to be significant ($t_{(96)}$= 4.42, p<0.001). Those respondents who had taught expressed a greater level of agreement with the statement (M=3.64, SD=.65) than those who had not taught. Therefore, for Q7, the null hypothesis that there is no difference between the two groups of faculty is rejected.

When examining Q8: "Computers in the classroom have helped me improve my teaching", an independent samples *t-test* analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have not (not taught) was found to be significant ($t_{(92)}$= 7.30, p<0.001). Those respondents who had taught expressed a greater level of agreement with the statement (M=3.64, SD=.65) than those who had not taught. Therefore, for Q8, the null hypothesis that there is no difference between the two groups of faculty is rejected.

When examining Q9: "I sometimes feel professionally threatened by the rapid changes occurring in technology", an independent samples *t-test* analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have not (not taught) was found to be significant ($t_{(96)}$= 2.01, p<0.05). Those respondents who had taught expressed a greater level of comfort with the changes occurring in technology (M=2.77, SD= 1.05) than those who had not taught. Therefore, for Q9, the null hypothesis that there is no difference between the two groups of faculty is rejected.

When examining Q11: "Technology is forced upon educators as a gimmick without regard to the impact that such technology has upon the quality of education being offered to the students", an independent samples *t-test* analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have not (not taught) was found to be not significant ($t_{(96)}$= 1.54, p<0.05). Those respondents who had taught expressed a greater level of comfort that technology is not a gimmick (M=2.80, SD=.77) than those who had not taught, however, not significantly so. Therefore, for Q11, Therefore, for Q8, the null hypothesis that there is no difference between the two groups of faculty is accepted.

When examining Q12: "With the advancement of both communication and educational technologies I feel that students today receive a richer educational experience than that of their parents", an independent samples *t-test* analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have not (not taught) was found to be not significant $t_{(96)}$= 3.27, p=0.001. Those respondents who had taught expressed a greater level of agreement with the statement (M=3.14, SD=.70) than those who had not taught. Therefore Q12, the null hypothesis that there is no difference between the two groups of faculty is not rejected.

When examining Q13: "Since the advent of the Internet, I am comfortable with assigning more intense research papers for my classes", an independent samples *t-test* analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have not (not taught) was found to be significant ($t_{(70)}$= 2.29, p<0.05). Those respondents who had taught expressed a greater level of agreement (M=2.93, SD=.90) with then statement than those who had not taught. Therefore, for Q13, the null hypothesis that there is no difference between the two groups of faculty is rejected.

When examining the comparison of the composite mean of all the questions in this section, an independent samples *t-test* analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have not (not taught) was found to be significant ($t_{(96)}$= 4.40, p<0.001). Those respondents who had taught expressed a greater level of agreement (M=3.05, SD=.49) with the statement than those who had not taught. Therefore, for a composite comparison of all the questions in this section, the null hypothesis that there is no difference between the two groups of faculty is rejected.

One-way ANOVA Analysis

This section describes the results of an analysis of variance in regards to the research question one: *Are faculty members who possess higher levels of technological self-efficacy (HE) and proficiency (HP) more likely to embrace distance education than those faculty members who possess lower level (LE) of technological self-efficacy and proficiency?* A one-way ANOVA was employed to test the null hypothesis for questions Q14, Q15, Q16, Q17, and Q18, which dealt with self reported faculty attitudes towards the use of distance education in higher education.

Table 16

Faculty attitudes towards distance education in higher education based upon levels of efficacy and proficiency

		N	Mean	SD
Q14. An Education class via distance learning, for the student, is less rigorous than the traditional classroom. [a]	LE	32	1.81	0.64
	HE	24	2.83	1.05
	HP	42	3.10	0.79
	Total	98	2.61	0.99
Q15. I have serious concerns about public universities awarding post graduate degrees in education at a distance. [a]	LE	32	1.78	0.61
	HE	24	2.25	0.99
	HP	42	2.36	0.96
	Total	98	2.14	0.90
Q16. Educational pedagogy is equally effective in distance learning as it is in face to face instruction.	LE	32	1.78	0.61
	HE	24	2.08	0.78
	HP	42	2.45	0.92
	Total	98	2.14	0.84
Q17. Verifiable assessment is a serious problem for distance education programs. [a]	LE	32	1.50	0.57
	HE	24	2.33	0.96
	HP	42	2.62	0.94
	Total	98	2.18	0.97
Q18. Distance education is a viable means for individuals to receive post graduate degrees in education.	LE	32	2.16	0.77
	HE	24	2.67	0.82
	HP	42	2.81	0.86
	Total	98	2.56	0.86
Composite Mean attitudes towards the efficacy of Distance Education.	LE	32	1.81	0.40
	HE	24	2.43	0.73
	HP	42	2.27	0.66
	Total	98	2.33	0.71

Note: HP=High Proficiency/High Efficacy; HE=Low Proficiency/High Efficacy; LE= Low Efficacy. [a] Q14, Q15, Q17 Reverse coded due to negative voice of question. A higher mean score indicates a more favorable attitude towards distance education.

The respondents were divided into subgroups: high proficiency (HP) for those individuals who achieved a mean score > 2.5 on the self reported proficiency questions, high self-efficacy (HE) which were those individuals who achieved a mean score $\underline{\geq}$ 2.5 on the self reported efficacy questions, but did not meet the standard for high proficiency and the low efficacy group (LE) who achieved a mean score < 2.5 on the self reported efficacy questions. The cutoff point of 2.5 was selected for these groupings because 2.5 fell into the upper 50 percentile of both efficiency and proficiency responses. For the proficiency category, this meant that respondents indicated that they could do a task independently the majority of the time. For the self-efficacy category, it meant that a respondent had a greater than neutral attitude towards the usage of technology.

A one-way ANOVA was conducted to examine differences in faculty expressed attitudes towards distance education in higher education (Table 17). Based upon their responses to targeted survey questions, respondents were placed into one of three groups: high proficiency/high self efficacy level (HP), the low proficiency/high self-efficacy level (HE) and the low self-efficacy level (LE).

When examining Q14: "An Education class via distance learning, for the student, is less rigorous than the traditional classroom", the groups were found to be significantly different ($F_{(2,95)}$= 23.40, p<0.001). Therefore for Q14, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at p<.001 between (LE) (*M*=1.81, *SD*=.64) and (HE) (*M*=2.83, *SD*=1.05) as well as (LE) (*M*=1.81, *SD*=.64) and (HP) (*M*=3.10, *SD*=.79). Differences between the (HP) (*M*=3.10, *SD*=.79) and (HE) (*M*=2.83, *SD*=1.05) subgroups were not found to be significant.

When examining Q15: "I have serious concerns about public universities awarding post graduate degrees in education at a distance", the groups were found to be significantly different ($F_{(2,95)}$= 4.24, p<0.001). Therefore for Q15, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at p<.001 between (LE) (*M*=1.76, *SD*=.99) and (HP) (*M*=2.36, *SD*=.96). Differences between the (HP) (*M*=2.36, *SD*=.96) and (HE) (*M*=2.25, *SD*=.99) subgroups were not found to be significant. Differences between the (LE) (*M*=1.76, *SD*=.99) and (HE) (*M*=2.25, *SD*=.99) subgroups were not found to be significant.

When examining Q16: "Educational pedagogy is equally effective in distance learning as it is in face to face instruction", the groups were found to be significantly different ($F_{(2,95)}$= 6.60, p=0.002). Therefore for Q16, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at p<.001 between (LE) (*M*=1.78, *SD*=.61) and (HP) (*M*=2.45, *SD*=.92). Differences between the (HP) (*M*=2.45, *SD*=.92) and (HE) (*M*=2.08, *SD*=.78) subgroups were not found to be significant. Differences between the (LE) (*M*=1.78, *SD*=.61) and (HE) (*M*=2.08, *SD*=.78) subgroups were not found to be significant.

When examining Q17: "Verifiable assessment is a serious problem for distance education programs", the groups were found to be significantly different ($F_{(2,95)}$= 16.57, p<0.001). Therefore for Q17, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at p<.001 between (LE) (*M*=1.50, *SD*=.57) and (HE) (*M*=2.33, *SD*=.96) as well as (LE) (*M*=1.50, *SD*=.57) and (HP) (*M*=2.62, *SD*=.94). Differences between the (HP) (*M*=2.62, *SD*=.94) and (HE) (*M*=2.33, *SD*=.96) subgroups were not found to be significant.

When examining Q18: "Distance education is a viable means for individuals to receive post graduate degrees in education", the groups were found to be significantly different ($F_{(2,95)}$= 6.01, p=0.002). Therefore for Q17, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at p<.001 between (LE) (*M*=2.16, *SD*=.77) and (HP) (*M*=2.81, *SD*=.86). Differences between the (HP) (*M*=2.81, *SD*=.86) and (HE) (*M*=2.67, *SD*=.82) subgroups were not found to be significant. Differences between the (LE) (*M*=2.16, *SD*=.77) and (HE) (*M*=2.67, *SD*=.82) subgroups were not found to be significant.

When examining the composite mean variances of the composite responses towards the efficacy of Distance Education, the groups were found to be significantly different ($F_{(2,95)}$= 6.01, p=0.002). Therefore for the overall composite means of all questions in this section, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis using the Scheffe' post hoc criterion (see table 18) for significance indicate that (LE) (*M*=1.81, *SD*=.40) was significantly less accepting of distance education overall than either of the remaining groups, (HE) (*M*=2.43, *SD*=.73) and (HP) (*M*=2.27, *SD*=.66) which, in the final analysis were not significantly different from each other. Of interest was the fact that high efficacy respondents were more accepting of distance education than high proficiency respondents, although not significantly so.

Table 17

One-way ANOVA – A comparison of groups (HP, HE, LE) regarding faculty attitudes towards distance education in higher education

		df	MS	F	p
Q14	Between Groups	2	15.72	23.40***	.000
	Within Groups	95	0.67		
	Total	97			
Q15	Between Groups	2	3.19	4.24*	.017
	Within Groups	95	0.75		
	Total	97			
Q16	Between Groups	2	4.15	6.60**	.002
	Within Groups	95	0.63		
	Total	97			
Q17	Between Groups	2	11.73	16.57***	.000
	Within Groups	95	0.71		
	Total	97			
Q18	Between Groups	2	4.05	6.01**	.003
	Within Groups	95	0.67		
	Total	97			

*p<.05. **p<.01. ***p<.001.

Table 18

Post Hoc Analysis – Multiple Comparisons groups (HP, HE, LE) regarding faculty attitudes towards distance education in higher education

Dependent Variable	(I) Overall Groupings	(J) Overall Groupings	Mean Difference (I-J)	Sig.
Q14	LE	HE	-1.02***	.000
		HP	-1.28***	.000
	HE	HP	-0.26*	.461
Q15	LE	HE	-0.47	.141
		HP	-0.58*	.022
	HE	HP	-0.11	.890
Q16	LE	HE	-0.30	.373
		HP	-0.67**	.002
	HE	HP	-0.37	.197
Q17	LE	HE	-0.83**	.002
		HP	-1.12***	.000
	HE	HP	-0.29	.418
Q18	LE	HE	-0.51	.076
		HP	-0.65**	.004
	HE	HP	-0.14	.794
Means	LE	HE	-0.63**	.001
		HP	-0.86***	.000
	HE	HP	-0.23	.325

Note: HP=High Proficiency/High Efficacy; HE=Low Proficiency/High Efficacy; LE= Low Efficacy. *p<.05. **p<.01. ***p<.001.

Table 19

Descriptive Statistics - faculty attitudes towards the hiring of DL graduates as education faculty based upon levels of efficacy and proficiency

		N	Mean	SD
Q19. Two applicants have applied for tenured track faculty positions in your department. Both have graduated from the same prestigious university where one received his/her terminal degree via distance learning and the other from the more traditional classroom	LE	32	1.75	0.72
	HE	24	2.46	0.83
	HP	42	2.69	0.87
	Total	**98**	**2.33**	**0.91**
Q20. Two applicants have applied for tenured track faculty positions in your department. Both have graduated from the same prestigious university where one received his/her terminal degree via distance learning and the other from the more traditional classroom	LE	30	2.13	0.68
	HE	24	2.58	0.78
	HP	42	3.05	0.80
	Total	**96**	**2.65**	**0.85**
Q21. In the field of higher education, I feel that applicants graduating from a distance learning graduate program at a public university will be given the same consideration for employment as the traditional student.	LE	30	1.73	0.52
	HE	24	2.25	0.74
	HP	42	2.33	0.87
	Total	**96**	**2.13**	**0.79**
Q22. Tenured faculty members in public universities should have received their advanced degrees from traditional institutions. [a]	LE	30	2.30	0.60
	HE	24	2.21	0.78
	HP	42	2.57	0.83
	Total	**96**	**2.40**	**0.76**
Q23. Faculty applicants who have received their doctorates from distance learning universities often lack the people skills necessary to be effective instructors. [a]	LE	31	2.13	0.76
	HE	24	2.58	0.72
	HP	42	2.88	0.67
	Total	**97**	**2.57**	**0.78**
Composite Mean of the attitudes related to the hiring of Distance Education graduates in higher education	LE	32	1.92	0.47
	HE	24	2.42	0.59
	HP	42	2.71	0.67
	Total	**98**	**2.38**	**0.68**

Note: HP=High Proficiency/High Efficacy; HE=Low Proficiency/High Efficacy; LE= Low Efficacy.
[a] Q22, Q23, reverse coded due to negative voice of question . A higher mean score indicates a more favorable attitude towards distance education.

This section describes the results of a one way ANOVA considering research question three: *Do members of the education faculty who possess higher levels of technological self-efficacy and proficiency significantly differ in their attitudes towards the hiring of on-line degree graduates for tenured track positions than do their colleagues?* (Table 20). Based upon their responses to targeted survey questions, respondents were placed into one of three groups: high proficiency/high self efficacy level (HP), the low proficiency/high self-efficacy level (HE) and the low self-efficacy level (LE).

When examining Q19: "Two applicants have applied for tenured track faculty positions in your department. Both have graduated from the same prestigious university where one received his/her terminal degree via distance learning and the other from the more traditional classroom", the groups were found to be significantly different ($F_{(2,95)}$= 12.54, p<0.001). Therefore for Q19, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at p=.005 between (HP) (*M*=2.69, *SD*=.87) and (HE) (*M*=2.46, *SD*=.83). Significant differences between (HE) (*M*=2.46, *SD*=.83) and (LE) (*M*=1.75, *SD*=.72) were found at p<.001. Differences between the (LE) (*M*=1.75, *SD*=.72) and (HE) (*M*=2.46, *SD*=.83) subgroups were not found to be significant.

When examining Q20: "Two applicants have applied for tenured track faculty positions in your department. Both graduated from the same prestigious university where one received his/her terminal degree via distance learning and the other from the more traditional classroom", groups were found to be significantly different ($F_{(2,95)}$= 12.89, p<0.001). Therefore for Q20, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at p<.001 between (HP) (*M*=3.05, *SD*=.80) and (LE) (*M*=2.13, *SD*=.68). Differences between the (LE) (*M*=2.13, *SD*=.68) and (HE) (*M*=2.58, *SD*=.78) subgroups were found to be significant at p<.05. Significant differences between (HP) (*M*=3.05, *SD*=.80) and (HE) (*M*=2.58, *SD*=.78) were not found to be significant.

When examining Q21: "In the field of higher education, I feel that applicants graduating from a distance learning graduate program at a public university will be given the same consideration for employment as the traditional student", groups were found to be significantly different ($F_{(2,95)}$= 6.12, p=0.003). Therefore for Q21, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at p<.05 between (HP) (*M*=2.33, *SD*=.87) and (HE) (*M*=2.25, *SD*=.74). Differences between the (LE) (*M*=1.73, *SD*=.52) and (HP) (*M*=2.33, *SD*=.87) subgroups were found to be significant at p<.005. Significant differences between (HE) (*M*=2.25, *SD*=.74) and (LE) (*M*=1.73, *SD*=.524) were not found to be significant.

When examining Q22: "Tenured faculty members in public universities should have received their advanced degrees from traditional institutions", the groups were found to be not significantly different ($F_{(2,95)}$= 2.14, p>0.05). Therefore for Q22, the null hypothesis contending that there is no significant difference among the three groups is not rejected. Post Hoc analysis identified no significant difference between subgroups. All respondents appeared neutral to the statement (HP) (*M*=2.57, *SD*=.83), (HE) (*M*=2.21, *SD*=.78), (LE) (*M*=2.30, *SD*=.60).

When examining Q23: "Faculty applicants who received their doctorates from distance learning universities often lack the people skills necessary to be effective instructors", the groups were found to be significantly different ($F_{(2,95)}$= 9.94, p<0.001). Therefore for Q23, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at p<.001 between (HP) (*M*=2.88, *SD*=.67) and (LE) (*M*=2.13, *SD*=.76). Differences between the (HE) (*M*=2.58, *SD*=.72) and (HP) (*M*=2.88, *SD*=.67) subgroups were not found to be significant. Significant differences between (HE) (*M*=2.58, *SD*=.72) and (LE) (*M*=2.13, *SD*=.76) were not found to be significant.

When examining the composite mean variances of the responses related to the hiring of Distance Education graduates in higher education, the groups were found to be significantly different ($F_{(2,95)}$= 16.20, p<0.001). Therefore for the overall composite means of all questions in this section, the null hypothesis contending there is no significant difference among the three groups is rejected. Post Hoc analysis using the Scheffe' post hoc criterion (see table 21) for significance indicate (LE) (*M*=1.92, *SD*=.47) was significantly less accepting of distance education overall than either of the remaining groups, (HE) (*M*=2.42, *SD*=.59) and (HP) (*M*=2.71, *SD*=.67) which

were not significantly different from each other. (HP) respondents were more accepting of distance education (HE) respondents, although not significantly so.

Table 20

One-way ANOVA – A Comparison of Groups (HP, HE, LE) Regarding Faculty Attitudes Towards Hiring DL Graduates as Education Faculty

		df	MS	F	p
Q19	Between Groups	2	8.31	12.54***	.000
	Within Groups	95	0.66		
	Total	97			
Q20	Between Groups	2	7.38	12.89***	.000
	Within Groups	95	0.57		
	Total	97			
Q21	Between Groups	2	3.40	6.12**	.003
	Within Groups	95	0.56		
	Total	97			
Q22	Between Groups	2	1.21	2.14	.124
	Within Groups	95	0.57		
	Total	97			
Q23	Between Groups	2	5.05	9.94***	.000
	Within Groups	95	0.51		
	Total	97			
Mean	Between Groups	2	5.64	16.20***	.000
	Within Groups	95	0.35		
	Total	97			

*p<.05. **p<.01. ***p<.001

Table 21

Post Hoc Analysis – Multiple Comparisons of groups (HP, HE, LE) regarding faculty attitudes towards hiring of DL graduates

Dependent Variable	(I) Overall Groupings	(J) Overall Groupings	Mean Difference (I-J)	Sig.
Q19	LE	HE	-0.71**	.005
		HP	-0.94***	.000
	HE	HP	-0.23	.507
Q20	LE	HE	-0.45	.081
		HP	-0.91***	.000
	HE	HP	-0.46*	.048
Q21	LE	HE	-0.52*	.035
		HP	-0.60**	.003
	HE	HP	-0.08	.900
Q22	LE	HE	0.09	.897
		HP	-0.27	.291
	HE	HP	-0.36	.148
Q23	LE	HE	-0.45	.055
		HP	-0.75***	.000
	HE	HP	-0.30	.237
Means	LE	HE	-0.50**	.007
		HP	-0.79***	.000
	HE	HP	-0.29	.142

Note: HP=High Proficiency/High Efficacy; HE=Low Proficiency/High Efficacy; LE=Low Efficacy. *p<.05. **p<.01. ***p<.001.

Qualitative Data Analysis

Interviews were held with survey respondents from each participating school. Teachers were selected for a pool of volunteers so that representations of the efficacy/proficiency sub-groups were present. The final representative numbers were achieved: HP – 4 respondents, HE – 5 respondents, LE – 3 respondents. The distribution of respondents per university were 3 respondents – Slippery Rock University, 2 respondents – Clarion University, 3 respondents – Edinboro University, 2 respondents - California University, 2 respondents – Shippensburg University.

Each interview began with introductions and basic interview guidelines. Participants were told that they would be asked a series of questions relating to computer technology and distance education. The interviewer remained silent while the participant responded to each question. If an answer was found to unique or ambiguous, an attempt to clarify the response was made by asking a follow-up or probing question. Respondents were asked to exclude for-profit programs such as the University of Phoenix on-line and think only of established universities with respected traditional components when answering. The interviews provided qualitative data which expanded upon the questions illustrated by the survey instrument.

While seven separate questions were asked, the primary focus of the interviews was to investigate the views of the respondents in regards to the current state of technology in education, including the technological state of those currently teaching technology courses. It was hoped to arrive at some indication as to perceived strengths and potential weaknesses that are evident in the system. The responses were examined in context of the respondents survey score as to self-efficacy and proficiency.

The second focus included respondent attitudes towards distance learning as a viable alternative to the traditional classroom approach for education students studying primarily at the post graduate level. Not only were the general attitudes examined, but there was an attempt to understand the reasoning behind those attitudes in both the areas of strengths and weaknesses that are perceived to be inherent in the distance education system.

The final focus of the questioning surrounded respondents' attitudes towards the hiring of faculty in higher education. An attempt was made to examine whether or not inconsistencies existed when it came time to make the pragmatic decision to recommend the hiring of distance learning graduates.

As programs of education are preparing future teachers to teach not only in today's classrooms, but classrooms of the future over the next 20 to 25 years, respondents commented upon how well professors of education are keeping up with the rapidly evolving technological requirements of the professions. F8 (HE) made the following comment:

> … I believe that professors are doing a fairly good job, I believe that it depends on the personality of the person. I do not see how a professor can maintain their status if they do not come to understand the technology (F8, 4-12).

F8 (HE) further commented:

> … no, as far as preparing teachers for the future. We are stuck on the present… who knows what is going to be there 25 years from now… it's hard for professors to keep up, they try, but trying to prepare our future teachers… for 25 years down the road... that is very difficult (F8, 4-12).

The comments noted above represent the ambiguity regarding the preparation of teachers of the future to operate in a technologically rich environment. F1 (LE) made a comment that was rather revealing and very pragmatic:

> It is interesting because some of the things that we teach our pre-service teachers are not even available in the schools… so there are some areas where we are ahead of the curve mostly because of the rural area where our students do their student teaching…I find that our student teachers are disappointed that they cannot do the things that they have been taught to do here because the technology is not available in the schools (F1, 4-4).

When asked about possible suggestions to overcome obstacles and begin to improve technological competence at universities, several explanations were offered. The first explanation was to address the lack of resources available, both in terms of equipment and in terms of time. A comment from F10 (LE) respondent illustrates this point.

> … A lot of it has to do with the hardware… The availability of hardware. I know that a lot more classrooms are getting the (pause), we call ours the Prometheus system, a high technology system, and that you also need professional development… but …professors, there are just so many demands on them it becomes a matter of just what you choose to do considering other obligations that are necessary, focusing on student achievement, their classrooms, service to the community and university… when do you have time to keep up with all the changes in technology? It is a real problem… (F10, 4-12).

F3 (HE) further commented:

> … (pause)… we can learn if we want to… so those of us who want to learn and keep up are keeping up, and we find ways of support. So, how do you motivate someone to do it who isn't self motivated is the issue… … there are just not any rewards. There are not enough rewards for doing it, not enough encouragement and if a professor can get by doing what they have been doing and feel successful at it then there is no motivation or reward to change, because it's a lot of work (F3, 4-5).

A general feeling of ambivalence in regards to graduate degrees being offered via distance education began to emerge. There seemed to be a politically correct response that suggested that the faculty respondents were accepting of distance learning programs, but after some more inn depth probing there began to emerge some of the underlying, unspoken concerns. The following comments can begin to illustrate this. The first comment comes from F1 (LE):

> … we consider ourselves to be a residency school… (pause)… it is something we take pride in… I certainly have gotten that impression. Obviously, not having the one on one contact with the student would be a detriment to learning… I talk to some students as well as faculty and they want to see their professors, they want to have interactions, they want to see their face and, you know the eyes, they get an idea… they glaze over when they don't get the idea. …Certainly, the advantage would be the convenience… we're trying to… get all kinds of diverse students to receive the education that we would want them to get and it is hard to earn a career and keep your family and go to school. So if you require your students to come to [campus] you are most certainly eliminating a certain percentage of the population you could make a selection from (F1, 4-4).

F7 (HE) demonstrated the apprehension that many faculty members may have regarding distance learning programs:

> Graduate school on-line? Yes… we are putting several of our courses on-line and considering putting one or two programs on on-line and we are all having second thoughts and third thoughts… do we know what we are doing? Are we sure this is going to work? And you don't know if it's going to work until you try it… but there are certain components of graduate school that we are having difficulty seeing how we would replace with using technology (F7, 4-10).

This respondent continued to illustrate concern regarding various aspects of graduate classroom that may not be suitable for the on-line environment. These concerns were mirrored by various respondents.

> The richness of a small group in a seminar… Can you really replicate that in an on-line discussion board setting? I've seen it both ways, I've seen some on-line conversations that are very rich and people who would actually offer their opinions more quickly on-line because they are less confident in face to face than they are on-line… so there is an advantage (F7, 4-10).

F12 (HE) added:

> … I guess it depends on what level the program is, M.Ed. for a working teacher… that seems more practical than a doctoral candidate who also has to learn about university life, and you can't do that unless you are there (F12, 4-13).

Given the diverse levels of technological comfort among university faculty one of the themes centered upon a discussion of individual comfort (self-efficacy) levels in using, and in some cases, acknowledging the usefulness of this technology. Some interviewers suggested that universities need to take a passive role and permit attrition to take care of the problem. This idea is illustrated F9 (HP):

> … (very long pause)… I am clearly thinking that those individuals who are not comfortable with technology will eventually retire, while those who are coming in are more comfortable with technology because it has been part of our everyday lives. And therefore, within time, (pause), there is going to be less and less of a feeling of uncomfortable-ness with technology, so again, through time, I believe that both the self-efficacy of professors is going to increase and of course they are going to feel that technology is an important perspective in education (F9, 4-12).

An observation presented F6 (LE) made the following point:

> It seems likes that the only people who can keep up with the technology are the people who are creating the technology (F6, 4-10).

Still another respondent F10 (LE) represents a view put forth by several other respondents that suggest the problem as possibly being related to globalization.

> … maybe in other countries like Japan where people seem to be a little more technologically accepting… students have these cell phones we are just starting to get into our society. So we might be in trouble globally with preparing our teachers to go to out into the schools, again, it is a financial issue… I don't think that there are too many schools that are keeping up with technology, so when teachers do go out there, if they are even a few years behind, they are still going to be relatively advanced in that particular school (F10, 4-12).

On three occasions a probing question was asked… What keeps faculty members who are pressed into teaching distance education classes from learning just the minimum to get by? F2 (HE) sums up a shared attitude with the following comment:

> We have to make sure that we get good feedback from the students about the quality of the experience and have discussions, almost like if someone were not pulling their weight in the classroom, there would be a system in place to hopefully identify that person and take corrective action (F2, 4-4).

There was an overall expressed sense of wariness when it came to programs granting distance graduate degrees. Much of this may be related to attitudes held regarding the perceived reputations of for-profit programs such as the University of Phoenix which continuously spam mailboxes and are sometimes viewed as diploma factories. It sometimes became a matter of guilt by association where on-line programs are often viewed as being all the same. F7 (HE) presented the candid view of the majority of the respondents on this issue but at the same time was open-minded enough to consider on-line degrees from established institutions.

> … I believe that we are wary of the lesser-known universities; I think that if a reputable university has an on-line degree… a reputation of producing quality instruction. …Although, I asked another professor in the education department and she said that it is a fallacy that these on-line degrees are looked at in the same way that traditional degrees are, so I know that some faculty do not take the on-line degrees as seriously as traditional degrees (F7, 4-10).

A theme that was mentioned by individuals from all three groups was the idea that graduate study was a 'rite of passage', in particular doctoral programs. As a part of traditional graduate programs, there was the perception that residency was an important component particularly at the doctorate level. The following comment by F11 (HP) illustrates this attitude:

> …I would think that there is going to be a lot of negative views. I think it is the traditional thinking that you need to… it's the reasoning that you need a kind of residency… why is that residency rule there? Until you do it, you do not realize why they have residency rules. So, how do you replace the working relationship between you and your advisor if you are not on campus? (pause) in that research group (F11, 4-13).

F11 (HP) continues:

> … you know the residency is a difficult thing and it's stressful and a lot of people don't make it because of it, especially returning adults. I wasn't young when I got my graduate degree so it's often difficult, but there is a reason for it… there are advantages for the student… (F11, 4-13).

In regards to the residency issue F8 (LE) respondent illustrated some of the benefits to the university community as a justification of having on campus residency requirements:

> … they (the universities) get a lot of teaching assistants and cheap labor. But educationally, I think there are reasons… (F6, 4-10).

F4 (HP) further pointed out that it actually may be a disadvantage for the graduate student to obtain a degree on-line:

> … I've watched colleagues struggle to finish a degree because they are not there with their advisor, with their committee, working all the time (F4, 4-5).

The undercurrent of negative feelings toward graduates of distance education graduate programs is summed up by F8 (HE):

> …. I think that there is kind of quiet bias against people who get their degrees on-line… You said not to consider University of Phoenix sort of place…so if we push them aside… there is no way one would necessarily know, if the job candidate said they did it entirely on-line, they would run the risk of maybe not taken quite as seriously, but I don't think anyone would come right out in the open and say that, but I think that is might be an undercurrent for a while (F8, 4-12).

F9 (HP) took a more clinical attitude towards distance education with the following statement:

> I'm fine with it, the issue that I have, if you are going to do it, you shouldn't do it lightly. The concern, I mean, design your program, invest in the program, I think that these distance education programs run the risk of being used as cash cows, in saying… Ohhh, we got to get a piece of that market share and I really think that the administration invents a way to look at it as a way to get money coming in and they can, if anything, be reluctant to really kind of design and… it's kind of like, let's get the thing up and running first and then we'll … if it works we'll give you…well that's not the way it works in a face to face program. You have to make it substantial and an initial commitment to it and then in time it bears fruit. I think unfortunately that urgency becomes a matter of money (F9, 4-12).

This *cash-cow* concern was voiced by several respondents and there appeared to be a kind of resistance from having distance education components forced on them from administration. Academic control emerges as an undercurrent.

One unexpected viewpoint came from two (HP) respondents who coincidentally both taught classes on-line and also were educational technology specialists at their respective universities. F11 (HP) took the following position:

> …absolutely not! It is insane to think that entire programs are offered at the graduate level entirely at a distance. There are still limitations… err… things that need to be examined. Don't get me wrong, distance education is a great tool, but it is just not ready, nor are those teaching it, to assure that the quality and rigor are the same. There are many questions that need to be answered first. I have no problem at teaching a class or so on-line, but at some point, there needs to be some kind of human interaction between student and professor (F11, 4-13).

F4 (HP) tended to mirror F11 but made the following additional observations:

> … To some, all students and professors are created equal. Administration just assumes that if you can teach a class face to face, you can teach it on-line. I see professors every day taking their notes and just pasting them on-line with a few PowerPoint's and that is a class. I don't think so! There is pedagogy at teaching on-line that we are barely addressing. We have just started to explore how to perform self-assessment of our instruction at a distance (F4, 4-5).

One primary focus of this research study was to assess the perceptions of faculty members in making decisions regarding the hiring of departmental faculty, particularly those who have matriculated from distance learning graduate programs. What was found was a general reluctance to give an distance education applicant the same consideration for employment as a graduate from a more traditional program One explanation that was offered was the newness of distance education. Education tends to be very conservative and resistant to change.

An (HE) respondent noted, as did several other respondents, that there is a general suspicion when it comes to accepting anything that falls outside the traditional range of what is thought to be graduate education. Nearly 10% of the respondents agreed that this attitude appears to be one of the key factors influencing decisions on hiring distance learning candidates in higher education. F8 (HE) noted that the profession needs time to adjust to new ideas:

> Obviously the biggest issue is time… any change takes a while for people to accept. (Pause)…. I am sure the doctoral program that is done as a weekend cohort is probably looked down upon by some faculty who did not work while they did their doctorate work… so there is a change that has to take place and time is certainly a factor. I believe also that an on-line program needs to have a mix of on-line courses and on-site course… I think that would benefit and maybe help the transition (F8, 4-12).

F5 (HP) further commented:

> …It's going to take time and experience with the animal. How many years ago was it that we wouldn't consider using calculators in the classroom? We didn't see the value of using computers for learning. So we have to get used to the technology first. Not all on-line instruction is created equal. I myself have taken a few on-line courses and some of there were sadly constructed, and I didn't see the value… they weren't valuable experiences. Others were extremely well constructed by somebody that knew what they were doing instead of someone who tries to just type their lectures and give quizzes on-line. Not effective (F5, 4-10).

Summary of Findings

When examining both the qualitative and quantitative data in relation to the research questions, the following common themes emerge.

> *Are faculty members who possess higher levels of technological levels of self-efficacy and proficiency more likely to embrace distance education than those faculty members who possess lower levels of technological levels of self-efficacy and proficiency?*

The quantitative data derived from ANOVA analysis demonstrated at $p<.05$ a significant difference between the various efficacy/proficiency groups. The significant difference existed between Low Efficacy *(M*=1.81) respondents and both High Efficacy *(M*=2.43) respondents and High Proficiency *(M*=2.67) respondents in regards to the acceptance of distance education as a viable method of course and program delivery. Although High Proficiency respondents were more accepting the High Efficacy respondents, the difference between the two subgroups was not significant. High Proficiency and High Efficacy respondents were significantly more accepting of distance education than were their Low Proficiency colleagues.

Qualitative analysis reflected that members of all subgroups expressed concerns regarding distance learning, but the nature of those concerns differed. High Proficiency respondents tended to focus on more internal factors related to instructor competence and motivation to acquire requisite skills than did Low Proficiency respondents who looked for external considerations such as the lack of equipment or time, administrative shortcomings, of a lack of sufficient support.

> *Do faculty members who have taught courses on-line express a greater sense of self-efficacy in regard to the use of technology than do their traditional colleagues who teach only using traditional classroom based instruction?*

The quantitative data derived from *t-test* analysis demonstrated at p<.05 a significant difference between the two groups. Those who have taught at a distance expressed a significantly greater sense of technological self-efficacy and confidence *(M*=3.06) than those who have not taught distance education classes *(M*=2.63).

Qualitative analysis demonstrated that members of both subgroups expressed concerns regarding distance learning, but the nature of those concerns differed. In fact, the two respondents who taught distance learning classes were the most critical of granting of degrees at a distance than any of the other respondents. Assessment, faculty preparation at teaching at a distance, specialized pedagogy requirements and rigor were some of the concerns voiced by the distance learning respondents.

> *Do members of the education faculty who possess higher levels of technological self-efficacy and proficiency significantly differ in their attitudes towards the hiring of on-line degree graduates for tenured track positions than do their colleagues?*

The quantitative data derived from ANOVA analysis, demonstrated at p<.05 a significant difference between the various efficacy/proficiency groups. The significant difference existed between Low Efficacy *(M*=1.92) respondents and both High Efficacy *(M*=2.42) respondents and High Proficiency *(M*=2.71) respondents in regards to attitudes toward the hiring of on-line degree graduates for tenured track positions. Although High Proficiency respondents were more accepting than the High Efficacy respondents, the difference between the two subgroups was not significant. High Proficiency and High Efficacy respondents were significantly more accepting of hiring distance education graduates than were their Low Proficiency colleagues, however, no group reached the threshold of *(M*= 3.00) that would indicate a willingness to hire such individuals. The best that can be said of the results is that the High Proficiency group was just slightly more than neutral *(M*=2.50). Such results lack a strong endorsement of the hiring of distance education distance education graduates as faculty in higher education.

Qualitative analyses indicated several factors that may account for this attitude. One of the primary factors illustrated was that distance learning programs tend to fly in the face of tradition. There is a perception that distance learning is somehow a shortcut. Another factor that was mentioned was the prevalence of for profit on-line programs that are looked upon as being "diploma mills". This perception may be generalized to all distance learning programs. A final factor is the perception that graduate programs need to be built around residency components so as to develop interpersonal skills at both the departmental and university level. The perception is that, without these skills, a candidate would be missing out on one of the critical ingredients found in quality graduate programs. Other factors included unanswered questions in regards to pedagogy, instructor readiness and technical competence, assessment and face-to face communication.

Implications and Concluding Comments

> "The marketing strategy in the on-line community must become… "Focus attention on what kinds of education people need, want, and for which they are willing to pay." The pitfall is the notion of technology for technology's sake and forgetting the learners." (Wilson, 2003, p.3)

When examining the results of this study, one thing becomes abundantly clear. There is a significant difference between how education faculty view distance learning programs based upon their particular level of self-efficacy in regards to the use of technology. While there is a significantly greater tendency to embrace distance learning as a vehicle for distance learning among high self-efficacy faculty members, there is still a reluctance with the majority of

respondents when it comes to recognizing those degrees as truly equivalent when it comes down to hiring those individuals for positions among higher education faculty. This apparent inconsistency presents a potential for an ethical dilemma in that many universities are marketing and delivering these distance degree programs with the understanding that there is no significant difference when compared to granting a traditional classroom based degree. While this study utilized a small sample of faculty within a rather homogeneous representation of state universities in Pennsylvania, it does closely correspond to findings made in other more broadly based previous studies. The information presented thus far in this study has been gleaned from a totally quantitative approach and is therefore somewhat limited in depth. The study is currently continuing with follow-up interviews of the survey respondents with a hope of clarifying and expanding upon the information gathered via the survey instrument. With over 50% of the faculty studied expressing a level of educational technology self-efficacy and proficiency in the low category, a greater need for technical training is evident. With a greater understanding and comfort level with the emerging technology, higher education faculty will become more aware of both the possibilities and limitations for the use of such technologies in the future.

Suggestions for future study include:

1. Regional and national studies being conducted with a more diversified university population so as to become more generalizable.
2. Follow-up longitudinal studies to follow the career paths of graduates of online programs to see what obstacles they may encounter in their various career paths.

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Editor's Note: These authors pose some interesting concepts. It is almost universally assumed that online students use distance learning because they cannot, for a variety of reasons, attend on-site classrooms. However, if a significant number of students choose online classes, not for convenience or access, but for different learning style preferences, a complex set of questions develop. The editors look forward to expanded research in this area to validate and enrich design of online courses.

Do Online Students Exhibit Different Learning Styles than Onsite Students?

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Abstract

This paper examines the question: "Do online students exhibit different learning styles than onsite students; and, if so, what accommodations relating to learning style differences may be made for online students?" Instructional issues were examined in light of data gathered from learning style inventories and personal surveys and resulted in implications for online course modification and design.

Keywords: learning styles of online vs. onsite students, online course delivery, online course design, curriculum adaptations for online environment, effective practices within online learning environment, curriculum design for e-learning

Instructional Issues

Most of us that have been teaching online classes are bothered by a fundamental question. That question centers around the effectiveness of online instruction. We do not wish to beg the question of how effective we might be in our "on ground" onsite or traditional classes but we assumed that when we have face to face contact with students that we may be able to pick up feedback from our students that indicates whether or not we have been effective –and, as a result, give us time to change strategies within our classes. Indicators such as the raised hand or body language may give us messages relating to student comprehension that are missing in online delivery. For the most part, such direct feedback does not occur within the online instruction format. Over the years, we have had above average success in online class instruction, and our failure rate has not been much different than what has occurred within onsite classes using the traditional methods. Perhaps we have done more to retain students in online classes or maybe we have just been lucky. We have held several assumptions about the makeup of online classes and wanted to explore our assumptions further. As we explored the question of effectiveness, it occurred to us that students who take online classes might do so to satisfy particular needs and might even have different learning styles than those students in our onsite classes. We decided to find out.

We used several measures to collect data. We developed our own online questionnaire to survey students at the beginning and end of online and onsite classes. This would allow us to get attitudinal information from first time online users. We could also sample students who had previously taken online courses to see if their expectations were different from those of first time online students. We also wanted to measure any attitudinal changes occurring by the end of the course. The results confirmed many of our suspicions but also gave us some new insights into student motivation within our classes.

We also wanted to look at learning styles for online learners and contrast it with those of students in our traditional offerings. Rather than develop our own learning styles instrument, we looked at

measures already in use. Of those we surveyed, (listed at the end of the paper) we found the Solomon and Felder survey from North Carolina State University to be well suited to our needs. It has high validity and has been in use for some time. Results from the survey are returned quickly and could be correlated rather easily. The survey could be completed quickly, and students also enjoyed taking the survey. We have collected data for three years from a variety of groups in an attempt to gather learning profiles for these students. Data were collected from graduate and undergraduate students in both online and traditional onsite classes. Our hope was that we would see a difference in the learning profiles for our online students from that of our onsite students. We had two purposes for collecting and analyzing the information. We thought, at the very least, this information would enable us to enhance our online offerings by developing assignments that would meet this "online" student profile. And, even if there was no difference in the learning styles, by ascertaining our current students' profiles, we could adjust our teaching styles and assignments from semester to semester. This last assumption proved to be very timely.

Background Information

At Middle Tennessee State University (MTSU), we have offered online instruction for over ten years. Like most schools, we have learned much about the process. We are still trying to discover what "best practice" is for online classes. All of us involved in this study have approached online learning based on our traditional teaching methods and experiences. We share a variety of teaching styles, and so our online offerings, while similar in many respects, have also all been somewhat different. We have had the benefit of working with our information technology staff and have had to work with the administration choice of WebCT, or work with no front end shell program (our own websites). Through our experiences, we have been able to share our triumphs and failures. Not only has this made us individually better, but it has also enabled us to collectively identify some weaknesses in our delivery.

Tennessee is a largely rural area. Our service area covers all of middle Tennessee – an area of several hundred square miles and more than 30 counties. When we started our online offerings, we discovered our area had grown both in size and complexity. Not only were we dealing with a wide area, but we were also dealing with almost a dozen different service providers and we had students from other states and countries. Some of our students had access to T1 lines and others had dial-up connections. We mention this not just because we are serving a different clientele than other states -- we are not -- but because we spent much of our energy on delivery problems rather than refining our curricular offerings. Though all of us work with practicing teachers (or pre-service teachers), our programs range from undergraduate teacher licensure preparation programs through Masters and Ed.S. Degree programs in Curriculum and Instruction involving add-on licensure in areas as diverse as English as a Second Language and Professional Administration. Finally, after solving most of our start-up problems, we were ready to look at the quality of our courses.

Our Online Survey

We developed several surveys to attempt to understand our students' perceptions about online classes. We had done this individually for some time to get feedback on our own courses, but thought it was time to get departmental input on all our courses. The survey used (See Online Class Survey Instrument [Appendix A]) is our own and probably similar to those used by other universities. We originally suspected that techno-savvy students would be those most likely to take online classes and many students might prefer onsite traditional course offerings. We had other ideas that were both confirmed and rebuked by our results. We also wanted to measure students' attitudinal changes form start to end of the classes.

We learned students take online classes for the convenience of pursuing a degree on their own timetable. They want to be with their families; they don't like the commute, and they don't want to fight for a parking place. Another thing we learned is that people who take online classes have a tendency to work on assignments at times which we would never offer to on-campus classes. Parents get online after their children are in bed. Professionals and educators stay at work to take advantage of business internet connections. Undergraduates tend to be online after midnight. In other words, online classes meet at any time a user is ready. Perhaps one of the biggest reasons students took online classes was not to have to come on to the MTSU campus at all! Finally, many students who did not like online classes said it did not meet their learning styles or they preferred a traditional classroom setting.

Once we understood that it was not the techno-savvy folks making up the largest portion of our online students, we were faced with the challenge of finding out how to improve instruction further. Did students with certain learning characteristics or abilities do better than others? Perhaps there was a profile of the successful online student – or at least we could find some multiple personalities that might tell us more about who we were dealing with and how best to meet their needs. Would the research by Howard Gardner and Associates help define students who had gifts in spatial, logical, or linear thinking as having some advantages in online classes? Unfortunately, no easy way to identify those folks was readily apparent to us.

Learning Styles

As a result, we considered examining educational research which focused on learning styles. It is important that instructors provide assignments to complement learning styles. Matching instructional style to learning style has been shown to enhance learning, that is, "…retain information longer, apply it more effectively, and have more positive attitudes toward the subject of the course." (Moallem, 2003) Were some student's learning styles predisposed to success in an online class? We discovered an online survey tool to assist us in defining and examining these learning pre-dispositions. Barbara Soloman and Richard Felder at North Carolina State University have developed a simple online survey (See Felder-Solomon Learning Styles Questionnaire [Appendix B]) to give students feedback on their learning styles. The survey is short (44 questions), has been used since 1997, and returns results to students in a short time. The four matched learning style areas contained in the survey are:

Solomon – Felder Learning Styles Summary	
Active – like to use new material such as discussion, explaining, group work. Taking notes is difficult. Active learners must be involved in learning by doing	**Reflective** – need time to think about new information, not good at memorization or just reading material one time
Sequential – like information presented in linear steps. Need some help putting the "big" picture together	**Global** – big picture learners can learn different things and then put them together
Sensing – like learning facts, follow proven methods of exploration and problem solving, good at memorization, careful, practical learners, like real world connections	**Intuitive** – like discovering possibilities and relationships, tend to take risks in learning, don't like to bog down in repetitive tasks, may be prone to careless mistakes
Visual – learn best by what they see, like charts graphs, pictures, films, demonstrations	**Verbal** – learn more from written or spoken presentations, like hearing discussion and explanation

The survey asks students to choose their preferences and gives them feedback concerning their own learning style. (See attached printout). Obviously, each student has some of all the learning styles but not necessarily a balance of each. Students who have a predilection for one style over another may have difficulty learning in some areas. By assessing not only our students' learning styles but also looking at our assignments in our classes, we were able to "map" student preferences and our offerings. Some studies have found that student with indicators of extroversion (Active), intuition (Intuitive), thinking and judging (Active and Sequential) tend to be more satisfied with online learning. (Altman, 1988). Learner satisfaction has a high correlation with distance education success. (Kelly, 1994) We were able to bear out these results when we compared the responses to our survey and the Learning Styles Index results (figure 1.).

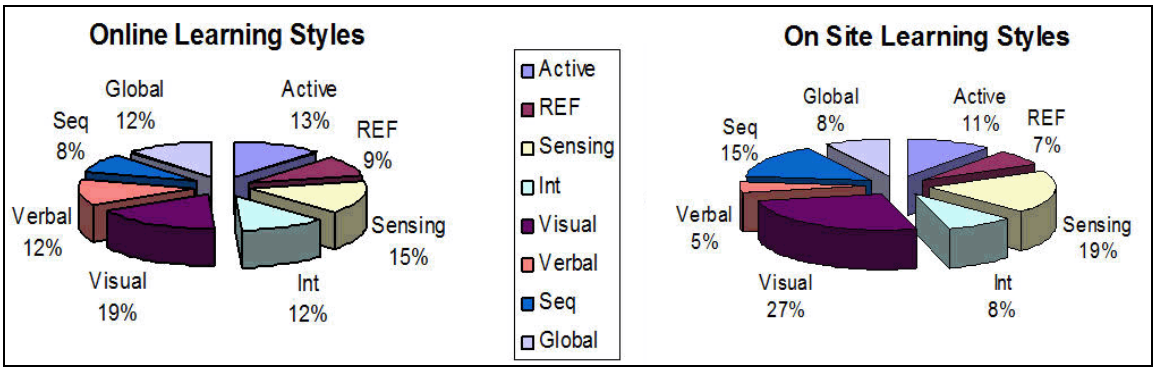

Figure 1. Learning Styles Index Results: Examples from Fall, 2006 N=16 for Online and N=64 for On Site

While we found students who preferred visual learning were slightly less inclined to prefer online classes, we found no one discernable learning style to be prevalent in most of our online classes. Preferences were more likely dictated by other considerations than learning styles. For example, setting one's own pace of learning outweighed the visual learning style preference one might expect as a consideration in choosing online classes. What we did find was that satisfaction in online course seemed to increase when we were careful to design assignments to cover all learning styles. This confirms earlier findings in classes where teachers design a variety of assignments and the students use all learning styles. (Feldman, 1996)

We found the following modifications and design considerations to be useful in meeting all learning styles.

Active/Reflective	Post notes or guides to information Use guided readings Add field experiences to online classes Use online discussions through software or list serves Add group work to get students to exchange information
Visual/Verbal	Organizers as product (webbing, charts, flow charts) Teleresearch Audio presentations (PowerPoint/Impactica) Assignment details are elaborated in written document
Sensing/Intuitive	Case studies. Analogies / Examples before theory.
Sequential/Global	Connect new material to old. Overview of assignment and objectives defined. Road map for a complex assignment

We would strongly recommend the use of this survey at the beginning of courses so modifications may be made. The website for the survey can be found at http://www.engr.ncsu.edu/learningstyles/ilsweb.html. Of course, if good course design is used at the onset, all learning styles should be met but it is possible to have a class with a imbalance or learning preference quite different from design expectations. We have certainly found each class may have quite a difference in balance of learning styles. Some of this may be due to the use of screening tools for certain classes or perhaps it is the luck of the draw. "Learning styles are a way to help improve your quality of learning. By understanding your own personal styles, you can adapt the learning process and techniques you use." (Learning-styles-online.com, homepage) We have found helpful information at Learning-styles-online.com website http://www.learning-styles-online.com/ this site is dedicated to helping you better understand learning styles, as well as providing an easy way to discover your own styles."

A consideration that is not found in any survey is a measure focusing on whether or not students have a propensity to procrastinate. No student will initially admit to procrastination – especially if it might affect entry into a class. There is no disputing that some students not faced with mandatory attendance will not be on time. Deadlines help, but this does not force students to participate in discussion or other areas where they must be active, on-time participants. Assessment should include incentives to not only get students to participate in a timely fashion but also in a meaningful way. Calendars and timelines help, but students can still "sit" in the back of the room if you let them. Course design and instructor persistence also help but cannot make students successful if they choose to procrastinate. Even time logs with WebCT and other programs do not provide any indication of quality time spent on task. These logs are measures of access time and login events only. The logs are useful tools for knowing which students might need some "prodding" to keep up with assignments.

Conclusions

Our "Best Practice" ideas have been continually evolving to keep up with our students. We have tried a variety of things to make sure students understand what kinds of challenges they face in an online class. Though we are now teaching the "computer generation," most students have been trained to succeed in an "on-ground" atmosphere for at least 12 years before they enter college. Many must relearn how to succeed in another setting. It is important to remember to remove as many obstacles to their success as possible to that online delivery is centered on learning content usable by various learning styles. Our advice is to keep the process dynamic and to seek feedback from students to be sure learning is as student centered as possible.

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Reviewed and Recommended Online Sources:

Abiator's online learning styles http://www.berghuis.co.nz/abiator/lsi/lsitest1.html

Lpride Learning styles http://www.ldpride.net/learning_style.html

Learning Styles Online.com http://www.learning-styles-online.com/

http://www.conti-creations.com/atlas.htm ATLAS learning styles of adults.

http://www.fastrak-consulting.co.uk/tactix/features/lngstyle/style04.htm Fastrack learning. Styles

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Appendix A

Online Class Survey Instrument

Instructions for completing this survey:

There are 4 parts to this survey:

- The first part consists of your perceptions about online classes before you enrolled and should be answered based on ideas you had prior to enrolling.
- The second part deals with your perceptions now that you have completed or are currently enrolled in an online class.
- The third part is filling out the online survey to determine your learning style.
- Finally, in the fourth section you are asked to indicate how well the online course has met your learning needs. This information not only gives us feedback about your motivation for taking an online class but will be invaluable in helping us design online classes that fit a variety of learning styles.

What you need to do:

1. Answer the questions in Parts 1, 2, & 4 on this form, save it as "perceptions-yourlastname.doc" and attach the file to an email to your instructor.
2. After you complete the online "learning styles" survey (Part 3) save it as "surveyresults.htm" and attach to an email to your instructor.

If you have problems emailing the files as attachments, please contact your instructor.

Part One

Online Course Perceptions Prior to Enrolling

Place an X next to all that are reasons that you considered before taking this course (what you considered before the course started)

	A	I don't want to drive to campus
	B	I don't like to sit in a classroom
	C	It was not possible for me to be available on the day/time that the on ground class was offered
	D	I have a learning style that matches online learning style
	E	I like to do my coursework at any time during the day or week
	F	I have taken online classes before and knew what to expect
	G	Online courses usually have less work
	H	I find the online assignments compatible with my needs and abilities
	I	I am computer/technology proficient and am at ease with technology
	J	This course is only offered in an online format
	L	I like being the person responsible for my own learning
	M	I was curious about how to take on online class
	N	I like being able to set the pace of learning
	O	I like being able to see all of the course content at any time
	P	Obligations to family
	Q	Distance from MTSU
1. If there are any other reasons not listed for taking an online course, please tell me below.		
2	**Would you take another online course? (Check yes or no)**	
	Yes	
	No	

Part Two

Online Course Perceptions While in Course

Now that you have enrolled or have completed an online class, place an X by ALL of the reasons that you think are GOOD REASONS for taking an online class.

	A	I don't want to drive to campus
	B	I don't like to sit in a classroom
	C	It was not possible for me to be available on the day/time that the on ground class was offered
	D	I have a learning style that matches online learning style
	E	I like to do my coursework at any time during the day or week
	F	I have taken online classes before and knew what to expect
	G	Online courses usually have less work
	H	I find the online assignments compatible with my needs and abilities
	I	I am computer/technology proficient and am at ease with technology
	J	This course is only offered in an online format
	K	I would not take this course if it were not required
	L	I like being the person responsible for my own learning
	M	I was curious about how to take on online class
	N	I like being able to set the pace of learning
	O	I like being able to see all of the course content at any time
	P	Obligations to family
	Q	Distance from MTSU
2. Are there reasons that would prevent or deter you from taking another online class? Please explain below.		

Part Three

Take the Learning Styles Assessment at http://www.engr.ncsu.edu/learningstyles/ilsweb.html (or use previous results) please do so to help us answer questions we have concerning our online courses. Once you have completed the survey, save it as "surveyresults.htm" and attach it to an email to your instructor.

Part Four

After you have taken the online survey, look at your results to answer the survey questions in Part 4. Please read the following information and answer the questions following this section about this online course.

Brief Description of Learning Styles

Active and Reflective Learners:

> Active learners tend to retain and understand information best by doing something active with it – discussing or applying it or explaining it to others. Reflective learners tend to think about it quietly before responding. They tend to like to work alone. Active learners might be described by "Let's try it and see how it works" while reflective learners might prefer "Let's think it through first".

Sensing and Intuitive Learners:

> Sensing learners like learning facts and solving problems by established patterns, while intuitive learners prefer discovering possibilities and don't depend on explained material. Sensors tend to be good at memorization and hands-on learning, while intuitive learners tend to grasp new concepts and abstractions.
>
> Sensors are more careful and practical than intuitors while intuitors tend to be more innovative and work faster. Sensors like courses with connection to the real world while intuitors don't want to get bogged down in routines "plug-in" courses.

Visual and Verbal Learners:

> Visual learners learn best when they can "see" pictures, diagrams, time lines, and etc. while verbal learners create pictures out of words – spoken or read.

Sequential and Global Learners:

Sequential learners understand best when things are laid out in a linear fashion – each step logically follows the previous one. Global learners tend to make connections in large jumps, absorbing material randomly without any seeming connection. Sequential learners follow logical paths in coming up with solutions to complex problems but global learners can solve problems quickly once they have grasped the "big" picture. Sequential learners can explain problem solution step by step whereas global learners may have difficulty explaining how they arrived at the solution.

For more explanation of your Learning Styles Survey, http://www.ncsu.edu/felder--public/ILSdir/styles.htm Now take a look at your Learning Styles Survey results from the online survey and consider the following questions:

3. How does this online course fit with your learning styles?

4. Specifically, how has the arrangement of this course met your learning style? Conversely, if the course has not met your learning style, identify how your needs were unmet. (If you have some needs met and some not met, so much the better.)

5. Finally, if the course could be changed to meet your learning needs, what changes would you suggest?

Use space below to answer questions 3-5:

The course fits will because I can see what's expected of me through the examples that are given for each assignment.

As I said, everything that is expected of me is laid out in a clear manner. I can easily obtain help from the instructor for any problem that I am experiencing.

I do not suggest any changes. This course works really well for me.

Answer the questions in Parts 1, 2, & 4 on this form, save it as "perceptions-yourlastname.doc" & attach the file to an email to your instructor.

After you complete the online "learning styles" survey (Part 3) save it as "surveyresults.htm" and attach to an email to your instructor. Thanks for your help!

Appendix B

Felder-Solomon Learning Styles Questionnaire

NC STATE UNIVERSITY

Index of Learning Styles Questionnaire

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Raleigh, North Carolina 27695

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Raleigh, NC 27695-7905

Directions

Please provide us with your full name. Your name will be printed on the information that is returned to you.

Full Name :_____

For each of the 44 questions below select either "a" or "b" to indicate your answer. Please choose only one answer for each question. If both "a" and "b" seem to apply to you, choose the one that applies more frequently. When you are finished selecting answers to each question please select the submit button at the end of the form.

1. I understand something better after I

    (a) try it out.

    (b) think it through.

2. I would rather be considered

    (a) realistic.

    (b) innovative.

3. When I think about what I did yesterday, I am most likely to get

    (a) a picture.

    (b) words.

4. I tend to

    (a) understand details of a subject but may be fuzzy about its overall structure.

    (b) understand the overall structure but may be fuzzy about details.

5. When I am learning something new, it helps me to

    (a) talk about it.

    (b) think about it.

6. If I were a teacher, I would rather teach a course

    (a) that deals with facts and real life situations.

    (b) that deals with ideas and theories.

7. I prefer to get new information in

    (a) pictures, diagrams, graphs, or maps.

    (b) written directions or verbal information.

8. Once I understand

    (a) all the parts, I understand the whole thing.

    (b) the whole thing, I see how the parts fit.

9. In a study group working on difficult material, I am more likely to

    (a) jump in and contribute ideas.

    (b) sit back and listen.

10. I find it easier

    (a) to learn facts.

    (b) to learn concepts.

11. In a book with lots of pictures and charts, I am likely to

    (a) look over the pictures and charts carefully.

    (b) focus on the written text.

12. When I solve math problems

    (a) I usually work my way to the solutions one step at a time.

    (b) I often just see the solutions but then have to struggle to figure out the steps to get to them.

13. In classes I have taken

    (a) I have usually gotten to know many of the students.

    (b) I have rarely gotten to know many of the students.

14. In reading nonfiction, I prefer

    (a) something that teaches me new facts or tells me how to do something.

    (b) something that gives me new ideas to think about.

15. I like teachers

    (a) who put a lot of diagrams on the board.

    (b) who spend a lot of time explaining.

16. When I'm analyzing a story or a novel

    (a) I think of the incidents and try to put them together to figure out the themes.

    (b) I just know what the themes are when I finish reading and then I have to go back and find the incidents that demonstrate them.

17. When I start a homework problem, I am more likely to

    (a) start working on the solution immediately.

    (b) try to fully understand the problem first.

18. I prefer the idea of

    (a) certainty.

    (b) theory.

19. I remember best

    (a) what I see.

    (b) what I hear.

20. It is more important to me that an instructor

    (a) lay out the material in clear sequential steps.

    (b) give me an overall picture and relate the material to other subjects.

21. I prefer to study
    (a) in a study group.
    (b) alone.
22. I am more likely to be considered
    (a) careful about the details of my work.
    (b) creative about how to do my work.
23. When I get directions to a new place, I prefer
    (a) a map.
    (b) written instructions.
24. I learn
    (a) at a fairly regular pace. If I study hard, I'll "get it."
    (b) in fits and starts. I'll be totally confused and then suddenly it all "clicks."
25. I would rather first
    (a) try things out.
    (b) think about how I'm going to do it.
26. When I am reading for enjoyment, I like writers to
    (a) clearly say what they mean.
    (b) say things in creative, interesting ways.
27. When I see a diagram or sketch in class, I am most likely to remember
    (a) the picture.
    (b) what the instructor said about it.
28. When considering a body of information, I am more likely to
    (a) focus on details and miss the big picture.
    (b) try to understand the big picture before getting into the details.
29. I more easily remember
    (a) something I have done.
    (b) something I have thought a lot about.
30. When I have to perform a task, I prefer to
    (a) master one way of doing it.
    (b) come up with new ways of doing it.
31. When someone is showing me data, I prefer
    (a) charts or graphs.
    (b) text summarizing the results.
32. When writing a paper, I am more likely to
    (a) work on (think about or write) the beginning of the paper and progress forward.
    (b) work on (think about or write) different parts of the paper and then order them.
33. When I have to work on a group project, I first want to
    (a) have "group brainstorming" where everyone contributes ideas.
    (b) brainstorm individually and then come together as a group to compare ideas.

34. I consider it higher praise to call someone

    (a) sensible.

    (b) imaginative.

35. When I meet people at a party, I am more likely to remember

    (a) what they looked like.

    (b) what they said about themselves.

36. When I am learning a new subject, I prefer to

    (a) stay focused on that subject, learning as much about it as I can.

    (b) try to make connections between that subject and related subjects.

37. I am more likely to be considered

    (a) outgoing.

    (b) reserved.

38. I prefer courses that emphasize

    (a) concrete material (facts, data).

    (b) abstract material (concepts, theories).

39. For entertainment, I would rather

    (a) watch television.

    (b) read a book.

40. Some teachers start their lectures with an outline of what they will cover. Such outlines are

    (a) somewhat helpful to me.

    (b) very helpful to me.

41. The idea of doing homework in groups, with one grade for the entire group,

    (a) appeals to me.

    (b) does not appeal to me.

42. When I am doing long calculations,

    (a) I tend to repeat all my steps and check my work carefully.

    (b) I find checking my work tiresome and have to force myself to do it.

43. I tend to picture places I have been

    (a) easily and fairly accurately.

    (b) with difficulty and without much detail.

44. When solving problems in a group, I would be more likely to

    (a) think of the steps in the solution process.

    (b) think of possible consequences or applications of the solution in a wide range of areas.

When you have completed filling out the above form please click the Submit button below. Your results will be returned to you. If you are not satisfied with your answers above please click on Reset to clear the form.

Editor's Note: The media sophistication of the majority of students (dare we say K through Grad School)) is a given. Clear standards for evaluation of efficacy of these student projects need to be established.

Using YouTube in the Classroom: A How-To Guide

Shonna L. Snyder, Sloane Burke

USA

Keywords: YouTube, technology, E-learning Learning Resource, online, education, distance education, video, distance learning, classroom, students, secondary education, higher education, college.

Introduction

Founded in 2005, YouTube has quickly become a leader in online media. YouTube is an Internet application in which people can upload, share, and watch videos. There are millions of messages being uploaded each day onto this forum (YouTube, 2007).

Creative teaching strategies that incorporate innovative technology motivate and engage learners who are technology savvy and are accustomed to the online environment. Using a variety of instructional methods and learning activities in the classroom or via distance education courses creates an enriched learning environment for the student (Beldarrain, 2006).

An innovative approach is to deliver instruction using video, computer and Internet technologies. Internet programs seem to have the advantage of evolving quickly and delivering timely information (Palmer, Graham, & Elliot, 2005). Internet-based resources like YouTube have the ability to integrate relevant content and encourage learners to reflect on how the material can be applied to many different settings. This speaks to the fast-paced learning style of younger learners that frequently use the Internet and YouTube (Educause, 2006; Lee & McLoughlin, 2007).

Creating content for YouTube also allows students to develop a deeper understanding of the course material as students are engaging in new, innovative technology applications as well as processing content. YouTube has the potential to expose learners to new insights and skills such as technology-based resources, as well as engage students in social networking (Educause, 2006; Lee & McLoughlin, 2007). YouTube also provides a platform for middle and high school students to learn the fundamentals of project creation and presentation which serve to better prepare learners for skills needed in college. YouTube provides college learners with innovative teaching and education strategies they will most likely be using in their future respective fields.

Target Audience

This teaching idea is designed for middle school through college students. The rigor of the rubric may be altered to become more demanding as the grade level increases. The technique can be used in any course whether it be face-to-face, hybrid, or completely online.

A Lesson Plan to Accommodate U-Tube

The lesson idea that follows could be included in a unit or lesson and incorporated in educational content areas such as health education, science, math, history, or social studies. It could follow lessons on accessing valid information, products and services, analyzing influences, and/or media literacy or used as a platform for learners to present their final course projects. The teacher could adapt or reconfigure this lesson to address the standards that are applicable to their curriculum.

That the Lesson Intends to Accomplish

Upon completion of this lesson, students will be able to:

1. Utilize video creation software.
2. Select appropriate materials to utilize in their YouTube presentations.
3. Utilize YouTube to create and communicate a message related to a class topic through media.
4. Utilize YouTube to present information to classmates.
5. Critically analyze peer presentations for appropriate content and communication skills using a scoring rubric.

Materials and Resources for the Lesson

Each student must have access to a computer with an Internet connection, either at home or school, to complete the project. The computer must also have some form of movie maker software. Many computers are already equipped with Microsoft Movie Maker or iMovie. Depending on the type of project the student chooses to complete, the student may also need access to a video camera. Teachers will copy the YouTube Step-by-Step Instructions (Figure 1) and YouTube Project Rubric (Figure 2) for each student. A sample YouTube video demonstrating what the finished product (the project) will look like should be available to show in the classroom. For some sample demonstrations, go to www. youtube. com and type in the topic of choice in the search box.

Procedures of the Lesson

Step 1

Teacher Preparation. Teachers will follow the YouTube Step-by-Step Instructions to create their own YouTube video. This YouTube video clip should be an example that students will model as they complete their projects. This will also give the teacher time to become familiar and comfortable with the software used to create the video as well as the YouTube website. After becoming familiar with the methods of creating a YouTube project, the teacher should be able to answer any student questions that arise. The teacher may also use his/her created sample project within the lessons prior to assigning the student project.

If the teacher is a novice at computer technology and the Internet, he/she may consult their school's information technology consultant. Frequently this is the computer teacher in the K-12 school setting.

Limitation: it is important to note that not all materials posted on YouTube are appropriate, valid, or reliable and therefore the teacher must take precautions so that students are being monitored and have an understanding of the appropriateness, validity and reliability of the message(s). Previous lessons that cover media literacy and/or accessing valid and reliable information, products and services will help students determine if the content they are viewing is worthy of being emulated or utilized as a message. It is also important to incorporate the family in this project at the K-12 level to help monitor student usage of YouTube.

Teachers could monitor K-12 students by having a designated class or class time to search for content that would be used in their presentations. Students could also be limited to only searching on prior approved websites. For example, if this was being used in a health education course, some prior approved sites might be www. cdc. gov or www. who. gov.

Some students may have very limited experience with this technology; therefore, students will need to become familiar with creating, downloading, and possibly editing their own video footage from either a camcorder, digital camera, webcam, or phone to their PC. Group projects are encouraged as students with various experience levels can learn from each other. The function of each of these devices varies so each learner is encouraged to explore their own equipment capabilities and the functions of editing software such as iMovie or Windows Movie Maker.

1. First you will need to create your movie and save it as a file that can be uploaded to YouTube. To do this you have two options.
    a. Option 1: You need to have a device that can capture digital movies such as a camcorder, webcam, or digital camera. You can then copy the movies or presentations to your computer, and then either upload them as-is or edit them with software such as iMovie or Windows Movie Maker to add titles and special effects such as adding music, documents, and photos to your video.
    b. Option 2: You can use iMovie or Windows Movie Maker to create a movie using Power Point, pictures and music downloaded from your computer or the Internet.
2. Next, you will need to create an account on YouTube. Minimal information is required and the account is free of charge.
3. In your account, click on the "Upload Video" icon found in the upper right hand corner of YouTube.
4. Enter your video title, description, and tags (key words to describe your video).
5. Choose your broadcast option. Students should choose "private" (only shared with 25 members) so the instructor can keep the presentation for the class members only versus the general public.
6. Include date and location of when the video was created (optional).
7. Choose the sharing option which allows users to leave comments and rate the video. This may be a good method to allow peers to comment on other YouTube presentations, especially in an online course.
8. Click next.
9. Browse your system files for your created video and upload it. YouTube disclaimer: Do not upload any TV shows, music videos, music concerts, or commercials without permission unless they consist entirely of content you created yourself.
10. Uploads usually take 1-5 minutes per MB on a high-speed connection, and converting your video takes a few minutes. The video is limited to 10 minutes and 100 MB.
11. Share the URL for presentations and viewing.
12. The video will be saved to your, "My Videos" folder for future presentations and viewing.

Figure 1: YouTube Step-by-Step Instructions for Students (YouTube, 2007)

The teacher will present the following assessment criteria and rating scale to students prior to presentation as part of the project description and requirements:

Rating Scale

0 = Did Not Attempt 1 = Attempted 3 = Met All Expectations 4 = Completed Beyond Expectations

Utilized video creation software	Points
Student utilized video creation software to create original media that had not been previously produced or created.	
Uploaded video presentation to YouTube.	
YouTube video and audio presentation was played with minimal technical difficulties.	
AVERAGE TOTAL POINTS	

COMMENTS:

Communicated a message through media	Points
Created a presentation that provides the audience with information about the topic.	
Utilized YouTube to present information to the class.	
Provided a verbal introduction of the video presentation prior to showing the presentation to the class.	
Provided a verbal conclusion to the video presentation after showing the presentation to the class.	
Effectively answered peer questions regarding the presentation.	
AVERAGE TOTAL POINTS	

COMMENTS:

Effectively navigated the Internet to access information.	Points
Utilized the Internet to find information about the topic.	
Internet sites met the criteria of “valid and reliable” as discussed in class.	
Used at least three different Internet sites to create presentation.	
All resource information was referenced on a reference page/slide.	
AVERAGE TOTAL POINTS	

COMMENTS:

Advocated for an issue by utilizing media	Points
Created a presentation that persuaded the audience.	
Created a presentation that persuaded the audience to encourage others.	
AVERAGE TOTAL POINTS	

COMMENTS:

Figure 2. YouTube Project Rubric

Step 2

Technology Preparation. Teachers will need to reserve a school computer lab if their classroom is not equipped with enough computers for each student. The computers will need to be equipped with movie maker software (e. g. , Windows Movie Maker, iMovie). Students could also be placed in groups to complete the project if computer availability is an issue or the instructor wants to create a collaborative learning experience. If applicable, learners can also work collaboratively with their group at home to create the YouTube presentation. Instructors should incorporate this time consideration when creating their lesson plan.

Additionally, teachers will want to determine if their school has blocked the usage of YouTube in their school. This is a common occurrence among schools since there have been many public incidents surrounding school students displayed on YouTube involving bullying and other mischievous behaviors (Crampton, 2007; Edwards, 2007). If teachers have been blocked by their school or school district, they may need to speak with administration about the availability of prior approved sites being used in their classrooms for learning.

Step 3

Review/Re-teach. Before providing an overview of the project requirements, the instructor should introduce, discuss and define the content and skills related to the topic at hand and provide examples. For example, if this project is occurring in an environmental health unit/class, the teacher may discuss how the media sends messages regarding the greenhouse effect through various media channels (i. e. , Al Gore produced a movie about global warming). The teacher may reiterate that these messages may influence viewers to begin riding bikes to school instead of driving cars. The teacher would also discuss how a student may advocate for others to begin riding their bikes to school. After reviewing and re-teaching when appropriate, the teacher would introduce the student project and explain that the media to be used to send the message will be YouTube.

Step 4

Student Project. The teacher will provide an overview of the project to the students before they go to the computer lab or their home to work on the YouTube project. The teacher will reinforce the skills of accessing valid information, advocacy, and communication and presentation skills. These are skills that the students will need to incorporate into their project. Next, the teacher will distribute the YouTube Step-by-Step Instructions (Figure 1) and the YouTube Project Rubric (Figure 2) to the students to use to complete the project and also discuss how students will be assessed.

Instructors should ensure ample time for the creation of this project and also be sure they are available for technical questions as they arise. If provided time to work on the projects in class, students will also inquire and learn from their peers. As a general guideline, teachers should provide two weeks for students to create, edit, and upload their project to YouTube. Prior to the upload and final presentation of the project students should submit their project to the teacher for review for accuracy and appropriateness of content. If the teacher's course is online, it is recommended that a discussion board for this assignment be provided to learners to post technical questions on the process. Students may be assigned a topic or the teacher may allow them to choose their own topic. The topic should relate to the unit of instruction.

Assessment Technique

Students will share their YouTube videos in class or online with their teacher and classmates on a scheduled date. The teacher will highlight key points of the YouTube video created by the students to facilitate discussion between learners during class time. Key points may include media messaging, advocacy, concepts related to the chosen topic, or any content that is important and relevant to the learning unit or final project. The instructor may also want to host a separate discussion about the experience of creating a YouTube video and encourage other learners to compare their experiences with those shared. Learners will be graded based on the YouTube Project Rubric. The teacher may also create a rubric modified from Figure 2 that allows students to evaluate their classmates' presentations.

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Editor's Note: Performance is the ultimate measure of learning. It can be measured throughout the course and as a culminating experience. Online forums allow the learning process to be observed as dialog. When students fail to explore concepts in depth, it raises concerns as to how well course goals will be reached. This study explores learning related aspects of the forum in an effort to design more motivating and effective e-learning experiences.

Promoting (quality) participation in online forums: A study of the use of forums in two online modules at the University of Mauritius

Harry Ponnusawmy, Mohammad Issack Santally

Abstract

Online forums are very widely used worldwide in the dissemination of e-learning courses. Most e-learning platforms, if not all, have a discussion tool embedded. The pedagogical importance of online forums has been emphasized by many authors (Simpson, 2004; Santally, 2003; Pilkington *et al.*, 2000). At the University of Mauritius, online forums are considered to be an important element of the e-learning process. However, there are no clear definitions in the way they are used in the courses. From survey studies, it has been found that students value the online forums, yet the participation rate and quality of contributions have not been as expected. This paper investigates discussion forums that have been used in two different e-learning courses over a period of two years at then undergraduate and master degree levels. It addresses quality participation from an instructional design perspective concerning e-learning. Observations can be accumulated to formulate a framework that can be used for effective implementation of discussion forums for e-learning. This foreword may also be used as an evaluation grid which can help monitor the quality of posting.

Introduction

The use of online discussion as a learning tool in higher education is a growing area of interest in higher education research. It is postulated that interactions between learners play a positive role in individual learning (George & Hotte, 2003). University educators who have been eager to make use of WEBCT, Blackboard and other online discussion formats are now becoming aware of the risks and limitations such as large time commitments, equity of access, and the need for well designed modules to create deep learning (Breuleux et al., 1998; Salmon, 2000; Kippin, 2003). However, in current distance learning platforms, communications tools are separated from other tools and from learning activities. This separation doesn't encourage learners to discuss the activities they carry out and to question each other about the difficulties they encounter. During individual learning activities, providing classical tools to communicate (i.e. forum, chat and electronic mail) is not enough to create true interactions between learners and to encourage collective knowledge building (George & Hotte, 2003). These tools can be suitable if a collective learning activity is set-up, for project-based learning (George & Leroux, 2001). Nevertheless, providing these generic communication tools isn't sufficient to create strong significant interactions between learners.

This paper reports the preliminary findings of a study carried out on the use of online forums at the University of Mauritius in two different modules. It has been found that online participation as well as the quality of participation is normally not as expected. This observation correlates with the fact that inclusion of forums in a learning environment is not sufficient to promote quality learning. The paper describes how forums have improved based on previous experience. The process, based on an action-research oriented perspective, is ongoing and iterative.

Discussion forums in the e-Learning Scenarios

Online communication tools are now readily available. They have the potential to foster new avenues for student interaction that are not possible without an online environment (Mock, 2001). A forum can also be viewed as a technique where participants question and discuss the presentation as a total group (Knox, 1987). Alternatively, a forum can be defined as "an open discussion carried on by one or more resource persons and an entire group." It is used when large groups of twenty-five persons or more meet for the purpose of diffusion of knowledge, information, or opinion. The integration of discussion forum in education may help to cover most of the communication task between students and teachers: debate about controversial topics, brainstorming, questioning, homework submission queries, news dissemination etc. Moreover, learners can also use forum discussion space as an online socializing zone. Mock (2001) points out that Forum is good for extended discussions and wide information dissemination but requires motivation or structure. He points out that in case studies, student participation was generally low unless the students were either motivated or given an explicit assignment for using a particular tool. Participants enjoyed online chat but it was difficult to organize students together simultaneously. Surveys indicated that students appreciated the availability of online tools but remarked that they would like more peer participation.

Online discussion forums are now regularly used as a component of distance education courses in tertiary education as a means of promoting interaction between course participants (Spatariu et al., 2004). Discussion forums create an environment similar to the face-to-face classroom environment where knowledge can be critically constructed, validated and shared (Knauka & Anderson, 1998). As the use of discussion forums has grown, an increasing number of researchers have attempted to produce models that measure and analyze the networked conversations produced (Campos, 2004). Computer–mediated communication (CMC) is now used by almost everyone in distance education training (Garrison, 2000) and comprises various forms of electronic communication including synchronous chat, audio and video, and asynchronous conferencing, email, and file exchange.

Support for the use of discussion forums in distance education is widespread. Discussion forums are said to allow students to see different perspectives which can help to foster new meaning construction (Heller & Kearsley, 1996; Ruberg et al., 1996). Discussion forums encourage student ownership of learning and collaborative problem-solving skills (Becker, 1992). They encourage participants to put their thoughts into writing in a way that others can understand, promoting self-reflective dialogue and dialogue with others (Valacich et al., 1994). Discussion forums have the potential to expose students to a broader range of views than face-to-face talk, and hence enable them to develop more complex perspectives on a topic (Prain & Lyons, 2000).

A number of different approaches have been attempted to identify quality in online discussions. Spatariu et al., (2004), having reviewed current literature, suggest that the majority of studies can be loosely categorized into one of four categories, according to the construct being measured: levels of disagreement; argument structure analysis; interaction-based; and content analysis.

Henri (1992) identified the following five dimensions which can be used to evaluate CMC: participative, social, interactive, cognitive and metacognitive. The cognitive and metacognitive dimensions measured reasoning, critical thought and self-awareness and, as such, are more likely to be of interest when attempting to reward participants for assessed discussion forum contribution. Garrison et al. (2000) developed a 'community of learning' model which assumes that learning occurs through the interaction of three core components: cognitive presence, teaching presence, and social presence. Cognitive presence is defined by Garrison et al. (2000) as "the extent to which the participants in any particular configuration of a community are able to construct meaning through sustained communication". Social presence deals with all those declarations of the students or tutors where the creation of a dynamic group is promoted,

including social relationships, expressions of emotions, and affirmation messages. Teaching presence considers the interactions of teachers and students, as they formulate questions, expose ideas and answer questions.

The cognitive presence concept was expanded by Garrison et al., (2001) into a four stage cognitive-processing model, which was used to assess critical thinking skills in on-line discussions. The model classified student responses into triggering, exploration, integration and resolution categories. The framework for the model was well documented and it was chosen as the second model for the research. Mcloughlin (2003) stipulates that trends in pedagogy are converging with the emergence of e-learning technologies that allow for greater learner control, personal responsibility, and collaboration. The advances in interactive technology are forcing instructional designers and technology users to confront and envision learner-centered instruction as well as their role in it.

Clearly, asynchronous tools provide greater opportunity for learners to "learn anytime, anywhere". This manner of thinking does foster additional expectations for greater learner autonomy and more learner options. With the increasing expectations that a learner will be guiding his or her own learning, instructors need to develop pedagogical strategies and employ technological tools that foster self-directed student inquiry and investigation. In such an environment, tools and strategies for student manipulation of information, discovery, generation or artifacts, and sharing or knowledge are highlighted (Hannafin & Land, 1997). With appropriate task design, students can examine problems at multiple levels of complexity, thereby deepening understanding.

Research Questions and Methods

The research questions that will be addressed in this preliminary investigation are:

- How are discussion forums being used in online modules at the University of Mauritius?
- What are the issues that need to be addressed to promote quality participation in online discussion forums?

The forums of two online courses will be analyzed in terms of:

- The amount of messages posted.
- The types of messages [social, course related, activity related] and interactions they generate.
- Tutor intervention on the forums
- Quality vs. quantity.

The methodology employed is based on Veerman (2001) method of categorizing messages

Table 1

Categorizing messages

Message		Examples
Non-Task related	Planning	"Shall we discuss the concept of interaction?"
	Technical	"Do you know how to change the diagram below?
	Social	"Smart thinking!"
	Nonsense	"What about a swim this afternoon?"
Task-related	New Idea	"Interaction means :responding to each other"
	Explanation	"I mean that you can integrate information of someone else in your reply"
	Evaluation	"I don't think that's a suitable description because the interaction also means interaction with computers or materials, see Laurillard definition"

Veerman (2001) focuses on task-related messages that he categorize as "New Idea", "Explanation" and "Evaluation". A "New idea" is described as a task-related message, focused on relevant content which is not mentioned before. An "explanation" is a message in which information is refined or elaborated that was already stated before, but elsewhere in the discussion. An "Evaluation" is a message in which an earlier contribution is critically discussed on strength and relevance in the light of the task. An evaluation is more than a short posting like "Yes, you are right" and often involves reasoning processes or justifications.

In addition, Veerman & Veldhuis-Diermanse (2001) state messages could contain information about planning the task, technical problems considering the system, conversational rules and reference to other facts, issues, summaries or remarks elsewhere in the discussion. Moreover some messages only referred to non-task related issues such as weather, joke etc.

Two modules have been selected to form the subjects of the study. Case 1**,** ILT6010 - Cognitive Sciences and Learning and Case 2, ILT1020 – Educational Technologies and Computer-Based Learning Environments, were analyzed based whether the forum messages posted were task on non-task related. The subject of each message with the number of replies to the topic/message was computed to have a quantitative insight. Then the replies to the messages were further classified according to the type of task-related or non-task related messages. The messages posted for the various batches were tabulated to have an overview of the nature of its content, which was analyzed based on a classification of Veerman et al. (1999).

Case 1

Cognitive Sciences and Learning - ILT6010

Setting and participants:

This module was first given in August 2004 as part of a Postgraduate Programme in "Computer-Mediated Communication and Pedagogies". The module was given fully online (Web-site + CD-ROM) to part-time (working) students and forums were used for different purposes in this module. Furthermore, for this module, the virtual learning platform was not used and thus forum systems that were used were open-source software from phpBB (http://www.phpbb.com). Sixteen students were enrolled on this module.

This module was again delivered in following academic year, August 2005, as part of the same course to the next cohort of student embarked on the same Postgraduate program in "Computer-Mediated Communication and Pedagogies". However, the module was delivered on a virtual learning platform, Moodle was used and it has an integrated forum systems, so it differed slightly from the previous delivery. Thirteen students were enrolled on this module.

The last cohort, August 2006, on the same postgraduate program in "Computer-Mediated Communication and Pedagogies" followed this module in the similar manner as the previous batch. The same Moodle platform was used but with a slight change in versioning, Odel (http://vcampus.uom.ac.mu/odel) was used. Ten students were enrolled in this module. The three batches form part of the population of this study.

Activities

The various activities and tasks were:

- Activity1: A knowledge model using MOT.
- Activity 2: Guide for a cognitively engineered pedagogy.
- Activity 3: Evaluation of an e-Learning Environment.
- Task: Reflection on the course and learning experience.

Case 2

Educational Technology and Computer-Based Learning Environments ILT 1020 Setting and participant:

It took place for a General Elective Module (GEM) offered by the University of Mauritius (UOM). The module ILT 1020 is open to all students of the University across faculty, irrespective of level or year of study.

The module (ILT 1020) has already been prototyped over 3 version changes. The first version, Version 1.0, was released in Semester 1 of academic year 2005/06 while version 2.0 was released the following semester, Semester 2 of academic year 2005/06. The last updated version, Version 3.0, was released in Semester 1 of academic year 2006/07. This case study is based on the forum discussion of participants, tutor as well as learners, of Version 3.0.

The module was delivered over one academic semester. There was no face-to-face interaction except for one start-up meeting to introduce the students to the learning environment and help a few with the online registration procedures.

The module consists of five activities that need to be carried out in sequence all the way through the semester. There is also a continuous assessment activity, which count as 40 % of total marks. It consists of forum participation that is transversal to every other activity included in this module.

The module is therefore delivered neither through the traditional classroom-based delivery nor through the classic e-learning approach (first and second generations). The belief is that classic e-learning through well-structured platforms, diffusion of contents online with structured chapters and classic activities such as open-ended questions and Multiple Choice Questions defeat the purpose of using e-learning technologies to foster innovative pedagogies and to promote knowledge construction and autonomous development of the student (Santally & Senteni, 2004). The occurrence of successful learning in this module is therefore defined as a three-phased activity: (a) Knowledge Acquisition Phase; (b) Knowledge Application Phase; (b) Knowledge Construction through Sharing and Reflexive Practice.

Activities

The module, "**Educational Technology and Computer-Based Learning Environments",** ILT 1020 comprises various activities or tasks, namely:

- Introduction of the learners
- Activity1: Designing a knowledge model of a course using MOT
- Activity 2: A presentation of model for a website
- Activity 3: Implementation of a website using the software Macromedia Dreamweaver
- Reflection on the course and learning experience

For a few who were late for registration, there was no face-to-face meeting because there was no request made and also the need was not felt. Those students pick up as they had classmates who were enrolled in the same module and guided them. However, those students seem to rush through Activity 1 and in general, scored less than the average mark for Activity 1 and some even failed to score 50% in Activity1.

It was also noted, by the tutor, that some students took a lot of time to get use to the learning environment. For example, in certain cases, they were not able to recognize that messages should be posted appropriately on discussion forum.

1. The different webpage has common features:
2. Name of the activity
3. Aim of the activity
4. Duration
5. Activity overview
6. Learning outcomes
7. Activity plan
8. Links to resources

Online participation of the learner counts as 15 % of the mark for continuous assessment, which is 60% of the total marks. The replies to forum discussions, number of messages posted and discussion initiated are the areas where the students are assessed. This forms part of their contribution to the virtual classroom community.

A first observation of use of online forums at the University of Mauritius in two online modules

Amount of messages

The number of messages posted on the different forums amount to a total of 2268 messages. Out of which 1903 messages were posted by under-graduate students (a total of 78 students) for module delivered for 2 different cohorts. The remaining 365 messages which were analyzed are posted by graduate students (a total of 39 students) for 3 different cohorts.

Table 2

Population of students and messages

Level	Students	Messages
Under-graduate	78	1903
Post-graduate	39	365
Total	117	2268

The average number of message posted by a student at the under-graduate level is 24. This was found to be higher, as compared to post-graduate level of 9 per student. This shows that there is greater need to show virtual presence by under-graduate students. It wase observed that there is a high percentage of social messages sent by the latter.

Types of messages

Non-task related vs. task related messages

The total number of messages that met the criteria to be considered as task related messages was higher, for all the batches, at undergraduate as well as post-graduate level, as compared to those considered as non-task related messages.

However, there are marked differences between the peak percentage of task related messages at undergraduate and post-graduate level. Postings, to forums, at undergraduate level, on average (75%) with a peak of 82%., attain task related message is lower as compared to post-graduate level posting, on average (84 %) with a peak of 94%.This suggests that postings, at post-graduate level, achieve higher quality as compared to postgraduate level postings'.

Table 3

Percentage of Non-Task related and Task related message posted

Batch	Non-Task related	Task related
ILT 1020_1	32	68
ILT 1020_2	18	82
ILT 6010_1	6	94
ILT 6010_ 2	18	82
ILT 6010 _3	23	77

At undergraduate level, there are high proportions of non-task related messages which can be categorized as social type messages. (See table 4). An average of 83 % of all non-task related messages are of social type messages

Table 4

Non-task related and social message

Batch	% Non-task related message	% Social messages
1020_1	32	75
1020_2	18	90
6010_1	7	14
6010_2	18	15
6010_3	23	30

For Batch1 of ILT1020, the percentage of social message is 75% of the total non-task related messages. Messages posted as part of a forum space dedicated to introducing the student do not form part of social messages as it is considered part of the activity. All other messages posted on

the different discussion thread amount, for socializing purposes, amount of 24% of messages posted by students

For Batch 2 of ILT1020, 18% of all messages posted were non-task related: out of which 90% were social messages. This shows a higher proportion, as compared to Batch 1, of non-task related messages can be classified as of type social messages.

It can be observed that the number of message posted in Batch 2 is lower than Batch 1, 1239 as compared to 664. This shows that fewer messages posted, the smaller is the proportion of non-task related messages. However, the lesser is the proportion of non-task related message, there is a significant proportion of social type messages, 90% as compared to 75%

At post-graduate level, the percentage of social messages sent form, on average, around 20 % of the non-task related messages. For Batch 1, only 14% of non-task related message are of a social type. Batch 2 has 15% of social type messages out of all non-task related messages. And Batch 3 has a total of 30% of social type messages for all non-task related messages

Out of all non-task related messages, posted on forums at the post-graduate level, there is a significantly higher number of technical types messages for Batches 1 and 3 and a higher proportion of planning type messages for Batch 2 (8). Table 5 summarizes the percentage of the non-task related message in the different types

Table 5

Distribution of non-task related message (ILT6010)

	Non-Task related		
	planning	technical	social
Batch1	14	72	14
Batch2	54	31	15
Batch 3	30	39	30

The percentage of task related postings which were made for the various batches is on average around 80 %. The distribution percentage for the various type of classification (New idea, Explanation and Evaluation) for task related messages is tabulated below.

Table 6

Distribution of task related messages

Batch	Task related	New Idea	Explanation	Evaluation
1020_1	68	38	60	2
1020_2	82	41	55	4
6010_1	93	42	39	19
6010_2	82	39	50	11
6010_3	73	32	58	10

Of the postings participants sent, a higher proportion can be classified as “New Idea” and “Explanation”. For undergraduate students, on average 3% of the task related message, are of “Evaluation” type. This demonstrates that while commenting on the topic participants mainly

appeared to answer each other's questions or to provide more information for fellow students' inquiry. Very few, 3 out of every 100, postings were elaborate enough to be classified as "Evaluation"

Similarly, at postgraduate level, a minor proportion, on average around 13% of task-related postings, were lengthy enough to provide in-depth analysis of the topic. Of those comments that were task-related, a slightly higher percentage, 49 % were providing information and explanations, and 38% were asking questions or creating new topics.

Tutor Interventions

The figure below shows clearly that the student, irrespective of level of study, participated much more than the tutor. It can be noted that the highest percentage participation of tutor is only 29%.

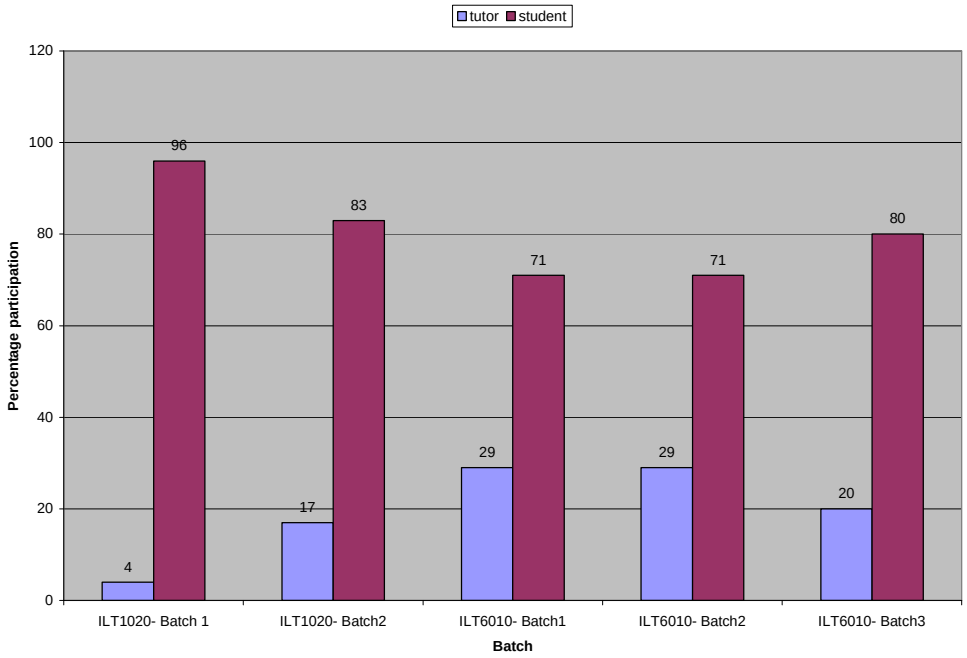

Figure 1: Tutor vs. student participation

Tutor intervention in Module ILT 6010

The module ILT 6010 has produced higher student participation compared to tutor participation. Seventy-four percent of all messages were posted by students. The students of Batch 2 were relatively more active than Batch 1. 146 messages were posted by Batch 2 as compared to 119 by Batch 1. There was an increase in participation of about 23%, while number of student enrolled decreased by 19 %.

It should be noted that despite the ratio of tutor to student participation remained constant (29:100), there was more messages posted on the forum. Thus, the despite the percentage of tutor intervention did not change, the number of messages posted by students increased. The number of messages posted by tutor increased for a decreasing number of students. This observation might imply that the students were more active in Batch 2.

The reduced tutor intervention in Batch 3, 20% as compared to 29% for previous Batch, showed a reduction of 32% of messages posted. This result can be interpreted as decreasing tutor participation induced less motivation for the students to send their posting.

Tutor intervention in Module ILT 1020

The two Batches for module ILT1020 were delivered by two different tutors. Since the content and teaching strategy remained more or less constant, it can be noted that there is quantitative and most probably qualitative differences in the postings. The number of messages posted on the forums by the tutor of Batch 1 of ILT1020 was twice that of the tutor for Batch 2 for the same course.

Black (2005) urged that instructors should structure asynchronous discussions in a way to encourage critical thinking. In a traditional classroom setting, discussion is often teacher-centered and dominated by a handful of students. Asynchronous discussions, on the other hand, are more evenly distributed because students have to respond and feel little or no social pressure against voicing their opinions.

Despite the number of student being constant (39), in the successive cohort, the number of posted message was reduced by more than 50 %, from 1239 to 664. This shows a clear indication that the total number of posted messages is considerable less when the tutor intervention increased. The 13 % increase in tutor participation generated a 46 % decrease in the total number of messages.

Consequently, there was a higher percentage (82%) of task-related posting, for Batch 1, as compared to 68%, for Batch 2. This can imply that the higher the participation rate of tutor, the higher is the percentage of on-task posting by the participant.

However, it should be noted that even if the participation rate of tutor is higher for Batch 2, there is an equal number of in-depth analysis ("Evaluation") types posting for both Batch 1 and Batch 2. Higher level learning, in reference to Solo taxonomy, is not affected by the high participation rate of tutor participation.

Quality

Quality of posting is considered here as an indication of the level of learning achieved. Considering the different level of learning outcome, in reference to Solo Taxonomy, the higher level will be considered as high quality posting. Consequently, an analysis of quality of posting will involve only posting which fall under the category of "Task related messages".

Table 7

Task related posting and tutor participation

Batch	New Idea (%)	Explanation (%)	Evaluation (%)	Teacher Participation (%)
1020_1	38	60	2	4
1020_2	41	55	4	17
6010_1	42	39	19	29
6010_2	39	50	11	29
6010_3	32	58	10	20

There is one feature in the quality of participants' discourse that merits discussion. There were rarely, on average 3 out of 100 task related postings for undergraduate and on average around 13 out of 100 task related postings at post-graduate level, that were in-depth analysis discussions

with participants genuinely exposing at length issues or debating meaning. A high proportion of a posting were of "Explanation" type, more than 57% at undergraduate level and around 48% at post-graduate level. From a quantitative analysis, it can be observed that the percentage of "new idea" type message is less than 40%, at both levels, which imply that ,on average every topic got at least one reply.

Survey and feedback

At the end of semester for module ILT 1020, a feedback open-ended questionnaire is sent to the students.

For both the batches, a persistent observation was that many of the student commented lengthier questions focused on the social aspect of the module rather than technical skills acquired. Some of the students were proud to have been able to communicate exclusively online with students they did not meet throughout the whole semester

There were complaints about students who set questions, addressed to lecturers only. Forums should have been open questions and not addressed to only one person, so that anyone could reply these questions Forum participation was also very useful and enjoyable interaction.

There was a need for synchronous interaction**:**

- Request to introduce e-classroom
- There was a general request for Chat Rooms to be incorporated in this module.

Many students complained yhat some notes and tutorials were available in French, which was very difficult as they had always been studying in an English medium. These French terms were really confusing for them. An English version would have been appropriate for most of the students.

- *Accessibility problem*: "whenever we have to submit our assignments, there are some problems with the platform."
- "I learnt a lot only by viewing the discussions and many times, I did not feel the need to intervene."

Others felt that they were too slow to interact/ react. From the students' feedback obtained, Batch 2 IlT1020, the general viewpoint was that, the forums were, as pointed out by Batch 1, very helpful and this helped many to post their queries without hesitation. Some of the participants indeed showed much more responsibility and their concern for the whole batch by sharing their knowledge to other in terms of sharing notes, giving guidelines to solve problems related to the platform and software. One of the main deceptions was that there was a lack of interaction or less participation of some students on forum.

From a few students, who devote time by writing lengthier feedback, it should be noted some common benefits such as:

Individual attention

Forum discussion provides beneficial means to meet the needs of diverse student population at the University. Some of them mention that:

Those who are on placement and find it difficult to attend lectures especially during work time.

Those who find that there is less attention on each individual's problem by the lecturer during lectures as there are too many students in a GEM class.

There are those who are too shy to raise their hands to ask questions.

Convenience

The communication mode, using discussion forum, has enabled student to study without the need to leave other commitments such as work placement. This means that the students have been able to learn at their own pace. Moreover, this also implies that students could spend longer hours on difficult areas and keep repeating a lesson, until they could understand it, without slowing down other students.

Availability

This online module communication channel, used by discussion forum, has enabled learners to access a tutorial whenever they wanted, at a convenient time. This flexibility allows participants to learn anytime, anywhere, according to their preferred learning styles.

More Interactive

Contrary to traditional classroom setting, this way of delivery was more interactive as those who may have been uncomfortable in asking questions in class can communicate more comfortably in the online forum. Moreover, there were learners who can take their own time to formulate their query which is not always possible, with the time restricted, limited period of a lecture.

Discussion

The findings of this study are consistent with results of previous studies concerning students' participation rates, (Guzdial & Turns, 2000; Hewitt and Tevlops, 1999). These studies indicate that students do not participate very intensively in discussion forums. The findings show that the task-related postings are less of “Evaluation” type.

Generally, the discussion threads in on-line forums appear to be quite short (Guzdial & Turns, 2000; Hewitt & Tevlops, 1999). The results of the present study confirm these results. There was a high number of short discussion, one or two lines (“New Idea” and “Explanation” type) messages.

The value of threaded discussions was confirmed by Wang and Woo (2007). Based on the empirical evidence of this study, forums, due to their asynchronous nature, might be an appropriate tool to promote equal, (irrespective of time and location) and high participation. Whether these possibilities are ever exploited depends on factors such as educators themselves and also on institutionalized practice.

This study also shows that students find it important to socialize on the forum. A high proportion of non-task related discussion was of “Social” type message. This was irrespective of level of studies and applied to undergraduate as well as postgraduate. A quantitative and qualitative analysis of the postings indicates that around 80% of the all postings were task-related.

Now, the question is, “Would a discussion focusing entirely on learning topics be a realistic goal?”. In fact, the optimal ratio of “task related” posting to “non-task related” posting for effective learning and collaboration is yet to be defined. Furthermore, a closer look at the data reveals that most of the postings received at least one reply. Of those that were attended, some were of reflection type, for example the forum on reflection on the activity where each participant created a topic on their personal experience, thereby leaving almost no opportunity of getting a reply or some were of informative type, again with no expectation of a reply.

Students dominated the discussion, not the tutor. This finding indicates that the online modules offered, both at graduate and post-graduate level, were student-centered. The instructor was purposefully creating a learning environment wherein students were in charge of their own

learning and responsive to each other. In 'forcing' students to assume the roles of facilitator, it was hypothesized that the students would become more engaged and comfortable with the conferencing system.

Another finding was, at the beginning of the modules, most students posted a strict minimum, just one message to introduce themselves in order to satisfy the minimum course requirement.

Answering questions or commenting on others' postings by providing information and analysis is evidently an important part of effective communication. Moreover, with a high-quality expectation, students should not only be seeking understanding by offering answers and elaborate replies, but should also request clarifications concerning other participants' postings. In order to represent genuine high quality, participants should be more daring, rather than being neutral or abstaining from giving their opinion. They should be asking more clarifications online rather than choosing the alternative of face-to-face meeting with peers or using telecommunication channels which would be to the detriment of the batch.

Furthermore, in a high-quality communication, the length of posting should definitely be longer. There is little hope for quality if the average length of the postings is only one or two sentences. The "non-task related" postings were mostly focused on social issues, which is important considering the social interactions needed to overcome the physical absence of the participants; and on technical problems, which were faced by users who were new to learning platforms technologies.

Conclusion

The purpose of the study was to analyze the patterns of participation and quality of students' posting in discussion forum from two modules delivered by VCILT over a period of two years. If educators, researchers, and technologists (software developers) are going to implement discussion forums on a large scale, for a varied population at different level, they definitely need more information on patterns of participation and quantity as well as quality of discussions on discussion forums in realistic educational settings. By combining quantitative and qualitative content analysis, the present study gives insights on how discussion forums are used and a few patterns, of student as well as tutor, participation. A framework, based on instructional design perspective on how discussion forums can be implemented, was derived from the various patterns observed. Discussions were rather Task Related, which means that some learning and new understanding might have occurred. On the other hand, for Non-Task Related posting, the social interchange was pre-dominant. Although social exchange is not probably very valuable for learning academic subjects, it might serve some other functions, like activating participation in discourse by building a sense of community.

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