Using clinical teaching assistants to foster student engagement in online courses

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ABSTRACT

The rapid growth in delivery of online courses in business programs has resulted in concern among faculty that the educational experience in online courses will be less rich and that the courses will too closely mirror independent study experiences. The authors undertook a pilot project regarding the use of Clinical Teaching Assistants in large enrollment online courses as a strategy to improve the online course experience and to encourage student engagement. Clinical Teaching Assistants, unlike graduate assistants, hold masters degrees or higher and have substantial business experience. The Clinical Teaching Assistants were teamed with full-time faculty members assigned to the various large section courses. The project was conducted over an academic year and involved over three hundred students enrolled in six different courses. Results were extremely positive. The pilot initiative was deemed a solid success by the faculty members involved, by the clinical teaching assistants, and importantly by the students. In one surprising finding, students indicated that the large online sections provided for more engagement and better feedback than they experienced in smaller traditional face-to-face classes.

Keywords: clinical teaching assistants, student engagement, online courses, large section classes, feedback

INTRODUCTION

The growth in online course delivery has intensified the discussion regarding appropriate class size and the impact of class size on the quality of education in online courses. Research by Robinson and Hullinger (2008) suggests that student engagement is a critical variable in the quality of the online education experience and outcomes. They encourage attention to this aspect of the educational process. This proposition is supported by research into the application of Bloom's taxonomy to the evaluation of online learning (Halawi, Pires, & Mccarthy, 2009) and research into perceptions of online learning in a study of business faculty and students (Tanner, Noser, & Totaro, 2009). One of the issues identified in two early studies of use of Web-based materials in large classes was the lack of faculty-student interaction provided (Eytayo, 2005; Halper, Kelly, & Chuang, 2007).

One common argument concerning appropriate class size suggests that the nature of online instruction requires more faculty time to ascertain that all students are fully engaged in the content and activities of the course and to provide appropriate and timely feedback. According to a study by Lawrence Tomei (2006), a traditionally delivered course required a total of 136.5 hours per semester whereas an online class required 155.83 hours, or about 14% more time than traditional instruction. Tomei went on to develop a formula to identify the "ideal" class size for an online class. Basing his calculations on the hours required per semester and the total hours typically available for instruction, he determined that the optimum class size for online instruction was twelve (12) students. Using the same logic, however, he determined that the optimum class size for traditional instruction was only seventeen (17) students! A report commissioned by the National Education Association also suggests that teaching a distance learning course does require more time than teaching a traditional course (National Education Association, 2000). These findings as well as the general perception by faculty that online classes require a significant amount of time has led some faculty/departments to place class size limits as low as 15-20 students per section for online courses. The report commissioned by the National Education Association contains survey data which notes that 31% of distance learning courses have 1-20 students; 33% have 21-40 students, 17% have 41-700 students, and 19% were not sure of the total student in the class. A survey of fourteen community colleges in Texas by Garcia found that the maximum class size for online classes ranges from twenty to thirty five with twenty five being the norm (Garcia, 2006).

Artificially low class sizes and the resulting high cost may serve as a barrier to what could be a cost effective educational delivery platform. Arguing against artificially low class sizes, another line of reasoning suggests that while faculty are required to spend a significant amount of time and effort in designing and developing an online course, delivery time becomes substantially less since many lectures can be recorded and retained. It has even been suggested that some distance learning courses have been entirely automated (Brown & Green, 2003). Also, some objective forms of assessment and grading may become more automated in online classes, thus allowing class size to increase without a corresponding increase in faculty workload. These features, coupled with the freedom from facility restraints that are necessary in face-to-face classes, leads to the opportunity to significantly increase class size in online classes. Concern has been expressed, however, over the impact of increasing class size and the quality of education.

A review of literature on the impact of class size on academic performance finds conflicting results. A number of studies show significant support for the importance of small classes. Feldman's (1984) meta-analysis of this literature found 22 studies showing a negative

relationship between class size and student ratings, 11 with curvilinear relationships (better ratings for very large classes than medium sized ones), 2 studies reporting no significant differences, and 2 reporting a positive relationship. Feldman concluded that large class size has a significantly negative influence on student ratings of teaching, most notably on ratings of the instructor's effectiveness and facilitative skills. In particular, it was noted that larger classes circumscribe students' opportunities to receive feedback and interact with other students and teachers.

One frequently quoted study is the Student Teacher Achievement Ratio (STAR) study conducted by the state of Tennessee which claimed to show improvement in student achievement following class-size reduction (Star, 1998). Other researchers question the STAR study findings. They point out that much of the supportive research on the relationship between class size and academic achievement focus on kindergarten through 3rd grade. (Hanushek, 1999; Hoxby, 1998). Relatively few studies have focused on the impact of class size on student learning in university academic settings (Arias & Walker, 2004; Blatchford, Edmonds & Marin, 2003; Karakaya, Ainscough & Chopporian, 2001). According to a study by Laria and Hubbal, when similar course material was presented using a similar pedagogical approach in both large and small college classes, predetermined learning objectives were met in all sections, regardless of size (Laria & Hubbal, 2008). The authors point out, however, that their data suggest that a large size class inhibits the spontaneous amount of time students spent discussing and interacting compared to the amount of time students spend interacting in a small size class.

In a study by the Buckeye Institute, it was determined that smaller class sizes did not help explain student achievement (The Buckeye Institute, 1998). Drago and Peltier studied the effects of class size on the effectiveness of online courses in all MBA courses taught during an academic year at a large, regional Midwestern university in the U.S. The results indicate no significant relationship between class size and overall course effectiveness. In addition, class size shows some significance in predicting instructor support and course structure. Unexpectedly the direction of this association was positive suggesting that larger classes lead to higher levels of instructor support and greater perceived course structure (Drago & Peltier, 2004).

Other studies have suggested that large section classes appear to successfully cover content and provide information but are less successful at achieving higher order learning objectives that require more engagement on the part of the student (McKeachie, 1990; U.S. Department of Education, 2009). Laia and Hubbal (2008) and Robinson and Hullinger (2008) recommend that approaches be developed to increase interaction in large classes, thus overcoming their key disadvantage. Anecdotal evidence from the authors' teaching and administrative careers support the need for timely interaction and feedback as a key component of student success in a variety of undergraduate and graduate business disciplines and programs.

USING CLINICAL TEACHING ASSISTANTS – PILOT PROJECT

The online MBA program at the College of Business at the University of North Alabama began in 2000 and has experienced significant growth in recent years. Most of this growth occurred as the College had a relatively inexpensive tuition structure, a cadre of graduate faculty who were committed to the potential for educating students through the use of Internet technologies and other new media, and a flexible admission policy, including a conditional admission category. The growth of the online enrollments overwhelmed the existing graduate faculty, but external financial pressures did not allow for the expansion of full-time faculty. The

reputation of the program as one with interested, engaging, and competent faculty soon became a difficult one to maintain because of the class sizes which were needed to accommodate the demand. The first attempt at a solution was to tighten enrollment and limit class sizes, but the realities of the need for a revenue stream complicated the implementation of class size limits. Some changes in admission requirements were implemented which slowed the growth, but did not cause significant reduction enrollments. Clearly, the solution to the competing priorities of maintaining fiscal position, maintaining high enrollments by qualified students, and maintaining the reputation of a program with individual student attention required a new model for delivery of the core courses in the MBA program. Within this context, a search began for ways to enhance the students' experience while allowing for large enrollments. Borrowing from concepts of graduate assistants, graders, and online tutorials, and recognizing the attention which is increasingly being given to faculty to student interaction and student to student interaction, collaborative and experiential learning, and the need for timely and individualized feedback on student work, the concept of Clinical Teaching Assistants was born.

Concerned about the impact on academic quality of large sections of online classes, the College began, in the summer of 2008, a pilot program where large classes (those with enrollments of 40 or more) were assigned a Clinical Teaching Assistant to assist the assigned professor and to assure that students were actively engaged with course content, to enable faculty to use cases, simulations and discussion questions as opposed to relying entirely on objective assessments, and to assure that students received prompt feedback on their performance and to questions that they pose. Over the 2008-2009 academic year, over 300 graduate students enrolled in six core MBA courses participated in the pilot project.

Clinical Teaching Assistants – Defined

Clinical Teaching Assistants are **not** Graduate Assistants and they are **not** Adjunct Faculty, though they have some characteristics of both. All hold masters degrees in relevant discipline areas and all have significant business experience. Some hold a Ph.D. For the pilot project, they were specifically selected to assist a graduate faculty member (the instructor of record) in managing the large enrollment classes. Each faculty member was given some latitude in defining the contractual duties of the Clinical Teaching Assistant (CTA) they were assigned. The key to all Clinical Assistant contracts was that the CTA should be responsible for three critical elements:

1) Assuring prompt feedback for student questions. The CTA was able to answer operational questions and simple academic questions. Other academic questions were referred to the instructor of record. The goal was a 24 hour or less response for all student inquiries.
2) Providing instructors the opportunity to assign essay and other subjective assessments. CTA's, when provided a scoring rubric by the instructor of record, was expected to assist in the grading of more subjective assessments.
3) Possibly the most important responsibility of the CTA was in assuring student engagement. Typically, each course included a discussion board where students and student teams were assigned discussion questions and group cases, projects and/or simulations. While each faculty member monitored the discussion board and provided general feedback, the day-to-day management of the discussion board was typically assigned to the CTA.

Prior to the beginning of each semester, the faculty member and the assigned clinical assistant jointly developed an agreement outlining their specific responsibilities in the class. A significant concern among university administrators and accreditation reviewers has been that a clear separation needs to exist between the instructor of record, who "teaches" the content and the CTA who supports the learning process. This concept is referred to as a "firewall." The agreement between the faculty member and CTA is an important first step in developing this "firewall," insuring that instructional components of the course are provided by the instructor of record and that the clinical assistant provides support and student feedback and enriches the engagement opportunity for students in the course. Near the end of the semester, the College of Business also assessed the extent to which students perceived that the faculty member was instructing the course and engaged with students and the student's perception of the involvement and helpfulness of the clinical teaching assistant. This feedback was shared and concerns were able to be addressed prior to the next semester.

A copy of the Faculty – Clinical Teaching Assistant Agreement form is provided as Table 1. This form was developed iteratively through the pilot project as experience was gained with the concepts of CTAs and student engagement. During each semester of the project, a focus group style meeting was held with all CTAs and instructors of record in attendance. These were designed as opportunities to share experiences and to learn from others who had attempted a variety of activities and strategies to enhance student engagement and success. In addition, many of the CTAs and all of the faculty members collaborated during the course of each semester and new challenges or successes were encountered. The group of participants was small enough that sharing was fairly easy, yet large enough that it was particularly fruitful, both in the formal focus group setting and in the informal communication channels that emerged from them. The present semester implementation of the model will use the attached agreement form as a means of establishing the responsibilities of CTAs (the number is being expanded considerably this semester) at the beginning of the semester. Then at the end of the semester assessment of the process will be conducted using the same form and faculty, CTA, and students will be asked for input into the assessment of the semester's activities.

Clinical Teaching Assistants – Findings of Pilot Project Assessment Survey

The pilot project began in the summer semester of 2008 with three faculty members and six CTAs. In the fall semester 2008, the project was expanded to include additional faculty and CTAs. During the fall semester of 2008, all students, faculty, and CTAs involved in the project were surveyed. The results were very positive from all stakeholders and the College of Business was encouraged by this feedback to continue development of the concept. The spring semester 2009 saw the project further expanded to include 14 CTAs. The following tables and paragraphs detail the results of this survey and analyze some of the results and actions taken based on those results.

Table 2 indicates students were very positive regarding the use of Clinical Teaching Assistants in large enrollment online classes. They were particularly positive regarding four statements:

Statement # 1 -"I feel that the use of Clinical Teaching Assistants in my course has substantially increased my participation in the class". 70% strongly agreed or agreed. Only 7% disagreed or strongly disagreed with this statement;

Statement # 8 - "The use of CTAs has allowed the instructor to concentrate on improving course content. 69% agreed or strongly agreed. Only 7% disagreed or strongly disagreed with this statement;

Statement # 9 - "I feel that overall the use of CTAs has resulted in better assessment techniques being employed in the course. 69% agreed or strongly agreed with this statement. Only 7% disagreed or strongly disagreed with this statement; and

Statement # 12 – " I feel that the use of CTAs is a cost efficient strategy that provides a way to deliver a quality course more inexpensively and may reduce the need for tuition increases. 76% agreed or strongly agreed. Only 4% disagreed or strongly disagreed with this statement.

It is also noteworthy that for statement # 10 – "In my opinion/experience, partly as the result of the use of CTA's, large enrollment classes frequently provide a better learning experience than do small classes taught by the faculty without CTA support, 56% of students agreed or strongly agreed. Only 13% disagreed or strongly disagreed.

Based on the response to this question, it would appear that slightly over half of students surveyed would prefer the learning experience of a large class that employs clinical teaching assistants, rather than a small class with only the instructor. Roughly one third of students were indifferent and only 13% of students indicated that they preferred a small class. As will be seen from Table 3, the results for this statement are significantly different from the perception of faculty members.

Table 3 reflects faculty attitude toward the use of CTAs in their classes. Like students, faculty members were also positive regarding the use of Clinical Teaching Assistants in their class. Thirteen of the fourteen faculty members (93%) agreed or strongly agreed with the following statements:

Statement # 1 – "The use of Clinical teaching Assistants has substantially increased student engagement in my courses";

Statement # 3 – "In my opinion, the use of CTAs has substantially improved student learning/performance in my class";

Statement # 4 – "Based on my perception, CTAs have resulted in improved student satisfaction in my course";

Statement # 7 – "Students receive quicker and more consistent feedback when a CTA is used in a course"; and

Statement # 9 '- "The use of CTA's has allowed faculty to concentrate on improving course content".

It is noteworthy that for only one statement was there disagreement. For Statement # 10 – "In my opinion, partly as the result of the use of CTA's, large enrollment classes frequently provide a better learning experience than do small classes taught by the faculty member alone" – 36% of the faculty agreed or strongly agreed. However, 50% of the faculty disagreed or strongly disagreed.

It would appear that faculty members continue to view smaller classes more favorably than large enrollment classes, although their response to the other questions would raise the question as to why they hold this attitude. It should be noted that this was the only statement where there was overall disagreement between faculty and students. The majority of students felt that that the large enrollment classes with CTAs were a better overall experience than smaller classes, although the difference in percentages was relatively small.

Table 4 outlines the perceptions of clinical teaching assistants. As might be expected, the clinical teaching assistants were unanimous in their support of the initiative that the pilot study addresses. In particular, there were 100 percent agree/strongly agree responses for two of the statements: Statement # 6:
"Students receive quicker and more consistent feedback when a CTA is used in a course"; and Statement # 11: "I feel that the use of CTA is a highly cost efficient strategy that provides a way to deliver a quality product more inexpensively." It is noteworthy that for only one of the eleven statements was there any responses that indicated disagreement with the statement. For statement # 10: "In my opinion, partly as the result of the use of CTA's, large enrollment classes frequently provide a better learning experience than do small classes taught by the faculty member alone", one clinical assistant disagreed (7%). Three were neutral (21%) and ten (72%) agreed or strongly greed with the statement, a percentage higher than the 56% of student who agreed with this somewhat controversial proposition.

Five of the fourteen clinical teaching assistants responded with comments to the open ended invitation for comments at the end of the questionnaire. Four of the five comments were positive, with the common thread being the significant improvement in communication, feedback and engagement that students had experienced and commented on. One comment addressed the concern that some instructors might feel that the use of clinical teaching assistants allows them more free time. The suggestion was made that instructors should be actively engaged in their courses along with the clinical teaching assistant.

In addition to the Likert scale satisfaction questions, there was one open ended question for both students and faculty. From the student questionnaire, a total of sixty two (62) comments were recorded. Of these, forty five (45) were positive, eight (8) were negative and nine (9) were neutral. Consistent with the survey findings, the comments suggested that students viewed the use of CTA's very favorably. It was noted by some that the usefulness depended a great deal on the quality of the CTA and the nature of the CTA's engagement with the class. Where the CTA was lacking in people skills and used simply to grade, comments were negative. For the majority of comments, however, the addition of the CTA was viewed a valuable and enriching.

For the fourteen faculty members assigned a CTA during the pilot study, only five extraneous comments were recorded. These comments were all positive. It was pointed out that the value of the CTA to student learning was highly dependent on how the CTA was utilized by the instructor. This seemed to be a key theme both by faculty and students.

Best Practices Learned from the Pilot Project:

While the pilot project in using Clinical Teaching Assistants has proven to be highly successful, several "best practices" lessons have been learned from the process:

- A clear "firewall" should be created to assure that the Clinical Teaching Assistant does not become a "de-facto instructor". The CTA may or may not meet accreditation standards in terms of faculty credentials. It becomes critical, then, that CTA's not be assigned instructional duties. A clear and explicit contract should be developed identifying specifically what the CTA is responsible for and outlining the instructor of record's areas of responsibility. The Clinical Teaching Assistant can become a valuable team member and, in partnership with the instructor, can play a

critical role in creating engagement on the part of students in large enrollment classes, but the CTA should not be assigned instructional responsibilities.

- Clinical Teaching Assistants may assist instructors with grading and clerical aspects of the course. When this becomes their only function, however, the course suffers. The primary benefit of CTA's appears to be in assuring student engagement. When the faculty member does not design the course with this in mind, a less than optimum experience will result.
- Regular faculty development workshops for CTA's and their assigned instructor are recommended. This provides an opportunity to review expectations and to remind all of the need for "firewall" protection to insure that instruction is delivered by the instructor of record and that the CTA is utilized primarily for student engagement. These regular faculty development workshops also provide a useful opportunity to highlight "best practices" successes with the program and to identify and resolve common problems.

FUTURE PLANS FOR THE PROJECT AND FUTURE RESEARCH IMPLICATIONS

Based on the feedback from this survey as well as anecdotal feedback from students, clinical teaching assistants, and graduate faculty, the pilot project is considered a success. The next phase of this implementation is the expansion of the use of CTAs to face-to-face, hybrid, and undergraduate large section classes. This phase of the project will be evaluated through surveys and analysis of the end of semester evaluations. Assessment of learning outcomes will also be used to evaluate the long term viability of this approach.

Table 1
Example of Contract/Agreement Form for Faculty and Clinical Teaching Assistant

Tasks for Faculty Members and Clinical Assistants: Revised—8/26/2009

COURSE name and number (including section designation)_____ Semester: Fall 2009

Faculty member responsibilities:

TASK	Before semester	Start of semester	Mid-term	Final	Day	Week	Other
Create the course content							
Deliver the course content/teach the course							
Make assignments and develop tests							
Establish and enforce proctoring rules							
Establish communication protocols with CTA							
Discuss issues like plagiarism and cheating with guilty parties							
Set grading parameters and rubrics for CAs							
Make final grading decisions							
Follow-up if issues arise							
Set time expectations for frequency and style of discussion posts, give examples.							
Engage in Student Interaction/Engagement Activities							
Hold office hours							

CAs will have tasks from the following set of options and timing descriptions:

TASK	Before semester	Start of semester	Mid-term	Final	Day	Week	Other
Communicate with professor							
Grading							
• Homework							
• Team projects							
• Exams							
• Discussion							
• Proctoring of exams							
Student Interaction/Engagement							
• Contact with non-participating students at start-up, to determine registration status.							
• Regularly track students to be sure all are participating and contact non-participants.							
• Blackboard e-mail							
• Discussion Board							
• Chat							
• Team Management/coordination							
• Office hour times (face-to-face or online) different from instructor's							
Technical Issues							
• Getting started							
• Problems as the semester develops							
• Blackboard							
• Tegrity							
• Login access							
• Uploading of assignments							
• Exam access							

Reviewed and approved on (date) _____ By (faculty member) _____
CTA(s) _____

Table 2 – Student Responses
Results of Pilot Study – Use of Clinical Teaching Assistants
N = 299

Statement	Strongly Agree/Agree	Neutral	Disagree/Strongly Disagree	Mean Score (5 to 1 scale)
1) I feel that the use of Clinical Teaching Assistants (CTAs) in my course has substantially increased my participation in the class.	70%	21.5%	8.5%	3.87
2) In my opinion, the use of a CTA in this class has substantially increased the time I spend on the course.	53%	33%	14%	3.53
3) In my opinion, the use of CTA's has substantially improved my performance/learning in this class	64%	26%	10%	3.74
4) Generally, I feel that my student colleagues and I are more satisfied with this course – overall – as a result of the addition of a CTA.	67%	27%	6%	3.81
5) I feel that I am less likely to withdraw from a course when a CTA is assigned to assist with the course.	53%	32%	15%	3.54
6) In my experience/opinion, students receive quicker and more consistent feedback when a CTA is used in a course.	83%	14%	3%	4.24
7) CTA's have improved the "'real-world" relevance of courses in which they are employed (in my opinion)	59%	32%	9%	3.67
8) The use of CTA's has allowed faculty to concentrate on improving course content in my opinion.	69%	23%	8%	3.79
9) I feel that overall the use of CTA's has resulted in better assessment techniques being employed in the course.	69%	24%	7%	3.83
10) In my opinion/experience, partly as the result of the use of CTA's, large enrollment classes frequently provide a better learning experience than do small classes taught by the faculty without CTA support.	56%	31%	13%	3.59
11) I feel that the use of CTAs is a cost efficient strategy that provides a way to deliver a quality course more inexpensively.	76%	20%	4%	4.01

Table 3 – Faculty Responses
Results of Pilot Study – Use of Clinical Teaching Assistants
N=14

Statement	Strongly Agree/Agree	Neutral	Disagree/Strongly Disagree	Mean Score (5 - 1 scale)
1) I feel that the use of Clinical Teaching Assistants (CTAs) in my course has substantially increased my participation in the class.	93%	0%	7%	4.5
2) In my opinion, the use of a CTA in this class has substantially increased the time students spend on my course.	71.5%	21.5%	7%	4.07
3) In my opinion, the use of CTA's has substantially improved student learning/performance in my class in which CTA's are used.	93%	0%	7%	4.36
4) Based on my perception, CTA's have resulted in improved student satisfaction in the courses in which they are used.	93%	0%	7%	4.36
5) There seem to be fewer student withdrawals (percentage) from classes that use a CTA.	36%%	64%	0%	2.86
6) Students receive quicker and more consistent feedback when a CTA is used in a course.	93%	7%	0%	4.71
7) CTA's have improved the "real-world" relevance of courses in which they are employed (in my opinion).	64%	15%	21%	3.7
8) The use of CTA's has allowed faculty to concentrate on improving course content.	93%	0%	7%	4.43
9) The use of CTA's has allowed faculty to improve assessments and assessment techniques.	79%	14%	7%	4.36
10) In my opinion, partly as the result of the use of CTA's, large enrollment classes frequently provide a better learning experience than do small classes taught by the faculty member alone.	36%	14%	50%	2.86
11) I feel that the use of CTAs is a highly cost efficient strategy that provides a way to deliver a quality product efficiently.	86%	7%	7%	4.29

Table 4 – Clinical Teaching Assistant Responses
Results of Pilot Study – Use of Clinical Teaching Assistants
N=14

Statement	Strongly Agree/Agree	Neutral	Disagree/Strongly Disagree	Mean Score (5-1 scale)
1) The use of Clinical Teaching Assistants has substantially increased student engagement in my course in which they are used.	86%	14%	0%	4.36
2) In my opinion, the use of a CTA in this class has substantially increased the time students spend on my course.	71%	229%	0%	4.14
3) In my opinion, the use of CTA's has substantially improved student learning/performance in my class in which CTA's are used.	93%	7%	0%	4.36
4) Based on my perception, CTA's have resulted in improved student satisfaction in the courses in which they are used.	85%	15%	0%	4.07
5) There seem to be fewer student withdrawals (percentage) from classes that use a CTA.	43%	57%	0%	3.5
6) Students receive quicker and more consistent feedback when a CTA is used in a course.	100%	0%	0%	4.57
7) CTA's have improved the "real-world" relevance of courses in which they are employed (in my opinion).	64%	7%	0%	4.36
8) The use of CTA's has allowed faculty to concentrate on improving course content.	86%	14%	0%	4.29
9) The use of CTA's has allowed faculty to improve assessments and assessment techniques.	79%	21%	0%	4.00
10) In my opinion, partly as the result of the use of CTA's, large enrollment classes frequently provide a better learning experience than do small classes taught by the faculty member alone.	72%	21%	7%	3.93
11) I feel that the use of CTAs is a highly cost efficient strategy that provides a way to deliver a quality product more inexpensively.	100%	0%	0%	4.57

References

Arias, J. J. & Walker D. M. (2004). Additional evidence on the relationship between class size and student preference. *Journal of Economic Education,* 35(4), 311-329.

Blatchford, P., Edmonds, S. & Marin, C. (2003). Class size, pupil attentiveness and peer relations. *British Journal of Educational Psychology*, 73, 15-36.

Brown, A. & Green, T. (2003). The fantasies and realities of online professional development, *Clearing House*, Jan/Feb 2003, 76 (3), 148.

Drago, W. & Peltier, J. (2004). The effects of class size on effectiveness of online courses, *Management Research News,* 27 (10), 27-41.

Eyitayo, O. T. (2005). Experimenting eLearning with a large class. International. *Journal of Education and Development using Information and Communication Technology*. Bridgetown:Oct/Nov 2005, 1(3), 160-171

Feldman, K. A. (1984). Class size and college students' evaluation of teachers and courses: a closer look. *Research in Higher Education*, 21, 45-116.

Garcia, M. (2006). Maximum size of distance learning classes. Study commissioned by the virtual colleges of Texas, South Texas College, 2006.

Halawi, L. A., Pires, S. & McCarthy, R. V. (2009). An evaluation of e-learning on the basis of Bloom's taxonomy: an exploratory study. *Journal of Education for Business,* Washington:Jul/Aug 2009. 84(6), 374-380.

Halper, S., Kelly, K., Chuang W. H. (2007). A Reflection on Coursestream System: A Virtual Classroom Streaming System Designed for Large Classes. *TechTrends.* Washington:Mar/Apr 2007, 51(2), 24-27, 53.

Hanushyek, E. (1999). Some findings from an independent investigation of the Tennessee STAR experiment and from other experiments of class size effects. *Educational Evaluation and Policy Analysis.* 21(2), Summer 1999.

Hoxby, C. (1998). The effects of class size and composition on student achievement: new evidence from natural population variation. NBEA Working Paper # 6069. National Bureau of Economic Research. December 1998.

Karakaya, F, Ainscong, L.T., & Chopporian, J. (2001). The effects of class size and learning style on student performance in multimedia based marketing courses. *Journal of Marketing Education,* 23 (20), 84-91.

Laria, G & Hubbal, H (2008). Assessing student engagement in small and large classes. *Transformative Dialogues: Teaching and Learning Journal.* 2 (1), August 2008.

McKeachie, W.J. (1990). Research on college teaching: The historical background. *Journal of Educational Psychology,* 82(2), 189-200.

National Education Association (2000). A survey of traditional and distance learning higher education members, *National Education Association,* June 2000.

Public Choices, Private Costs (1998). Two new studies cast doubt on benefits of class-size educations, The Buckeye Institute for Public Policy Solutions, (Dayton, Ohio), September 1998.

Robinson, C. C. (2009). New benchmarks in higher education: student engagement in online learning. (Survey). *Journal of Education for Business*, 101-109.

Tanner, J. R., Noser, T. C. & Totaro, M. W. (2009). Business faculty and undergraduate students' perceptions of online learning: a comparative study. *Journal of Information Systems Education*. West Lafayette:Spring 2009, 20(1), 29-40

Tomei, Lawrence (2006). The impact of online teaching on faculty load: computing the ideal class size for online courses. *Journal of Technology and Teacher Education,* Sept. 22, 2006.

U.S. Department of Education, Office of Planning, Evaluation, and Policy Development (2009). Evaluation of evidence-based practices in online learning: a meta-analysis and review of online learning students. Washington, D.C.