The Course Management System, e-Class at Democritus University of Thrace: Where do we Stand?

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Abstract: The online CMS has become popular in recent years in higher education institutions due to the implementation of distance education in Greece. The purpose of this study was to examine the students' perceptions toward physical education courses using the online CMS, e-Class at Democritus University of Thrace. Participants were two hundred eleven (n=211) undergraduate students, between the ages from 19-24 years old. One hundred fifteen (71.1%) of the participants were male and sixty one were female (28.9%). Data was collected using an online questionnaire during one week period. The statistical analysis included both descriptive statistics and inferential statistics. Overall, participants in this study had positive perceptions toward e-Class and the results indicated that such systems were easy to use and advantageous in Physical Education learning and assisted them to develop their skills. Students' responses in the survey questions also supported the benefits of using the CMS for their learning.

Introduction

Online learning opportunities are rapidly expanding in higher education. Course management systems such as WebCT and Blackboard are enjoying wide use as delivery systems for online course material (Carnevale, 2005; Hutchins, 2001; Roach, 2006). There is increased interest in the effective implementation of course management systems and the ubiquity of course management systems seems to suggest that more research on the successful implementation of such systems is needed.

Researchers have identified a number of factors associated with students' satisfaction with distance learning and online learning in particular. These factors include course structure (Arbaugh & Duray, 2002; Stein, 2004; Stein, Wanstreet, Calvin, Overtoom & Wheaton, 2005), class size (Arbaugh & Duray, 2001), interaction among students and between students and instructor (dialogue) (Kim & Moore, 2005; Stein et al., 2005), and learner characteristics such as self-efficacy (Lee & Witta, 2001; Lim, 2001), age (Billings, Connors, & Skiba, 2001), learner autonomy (Bray, Aoki & Dlugosh, 2008), gender (Stokes, 2003), Internet experience (Stokes, 2003), and distance learning experience (Arbaugh, 2004).

In a study involving 201 students enrolled in distance learning courses using formats ranging from face-to-face to completely online instruction at three different universities, Stein reports that course structure was the most important determinant of satisfaction reported by students. The results of this report suggested that common course elements such as objectives, deadlines, and promoting discussion were essential to student satisfaction (Stein, 2004). Course structure was determined to lead to increased satisfaction with perceived learning in a study involving 201 students engaged in Web supported courses (up to half the course delivered online) and Web-delivered courses (90% or more of the course delivered online) offered at three institutions of higher education (Stein et al., 2005).

A study of student satisfaction with distance learning courses offered primarily through use of IVC, but supported with online discussions and e-mail (elements of most online distance learning courses) found that nearly 70% of the respondents (who were predominantly undergraduate students) indicated that they were satisfied (Shirvani, 2002). Shirvani (2002) found a statistically significant number of seniors and graduate students who reported they were satisfied with the courses studied as compared to freshmen, sophomores, and juniors ($n = 277$), even though students at the senior and graduate level also indicated that they were less likely to interact or ask the instructor questions. For these students, it appeared that interaction as measured in this study did not weaken their satisfaction with the course (Shirvani, 2002). Student interaction with colleagues and the course instructor was found to be significantly related to the level of course satisfaction in a study of 82 graduate students who were enrolled in at least one Web-based course (Kim & Moore, 2005).

Finally, in a study comparing students enrolled in online and traditional face-to face versions of the same course taught by the same instructor, Johnson, Aragon, Shaik, and Palma-Rivas (2000) found that students in both courses were satisfied, but the students in the traditional face-to face course revealed slightly greater satisfaction with the instructor's performance. There were also significant differences in the reported level of interaction among students and between students and the instructor. The online learners rated the interaction lower than did students in the face-to-face course, but students in both learning environments rated interaction positively (Johnson et al., 2000).

Student satisfaction with the online courses offered by the Department of Physical Education & Sport Science at Democritus University of Thrace is an important issue. As a major stakeholder in the academic program, student satisfaction with the courses and the learning environment in which they are offered is essential. Students who are dissatisfied with an online course offered in this degree program may elect to take future courses by other means or may elect to study elsewhere – an option the university participating in this study does not wish to see its students exercise. Therefore, the purpose of this study was to evaluate the educational services offered by an asynchronous course management system (e-Class) for the support of the traditional instruction method in the classroom at the Democritus University of Thrace. The study looked at the following general research statements:

1. What are the students' perceptions toward physical education courses using the online CMS, e-Class at Democritus University of Thrace?

Methods

Participants

The participants included in this study were undergraduate students enrolled in courses at the Democritus University of Thrace, Department of Physical Education & Sport Sciences in the spring semester of 2008. The sampling frame used for this study was convenience sampling. For data collection, the researchers asked five instructors who were delivering online instructions in different subject disciplines at the university to allow students' participation in the study. As a result, two hundred eleven (n=211) students were participated in the data collection. The participants consisted of 76 (36%) freshmen, 58 (27.4%) sophomores or juniors, and 77 (36.5%) seniors. One hundred fifteen (71.1%) of the participants were male and sixty one were female (28.9%), between the ages from 19-24 years old. The students' participation was voluntary, and the anonymity of students' responses and their confidentiality as participants were explained before distributing the instruments.

Instrumentation

Examination of the literature revealed the Course Management System Scale - CMSS (Vernadaki, Antoniou, Vernadakis, Giannousi & Kioumourtzoglou, 2008) as a valid instrument for testing students' perception toward CMS. This instrument was developed to evaluate the educational services offered by an asynchronous course management system (e-Class) for the support of the traditional instruction method in the classroom. Reliability estimates of the original instrument based on Cronbach's alpha measure was .78.

The CMSS survey contained four sections: a) demographic information, b) information technology skills, c) the students' perception toward online CMS, and d) the students' use of CMS tools.

The first section of the survey included questions relative with the participants' demographic information (age, gender, academic year) while the second section constituted of 8 questions on the participants' prior expertise with computers and computer applications, such as: word processing, spreadsheet, presentation, graphics, communications systems, computer maintenance, online library resources and course management system. Each of these eight items had five response categories coded from 1 to 5 with 1=poor, 2=fair, 3=good, 4=very good and 5=excellent.

In the third section, five dimensions were used to assess the students' perceptions toward online CMS, including *participation dimension* (5 items), *educational material dimension* (4 items), *usefulness dimension* (4 items), *user control dimension* (4 items), and *interaction dimension* (4 items). Under the five dimensions previously identified,

twenty one items were involved such as: My participation in class discussions has improved significantly; The educational material was clear; The registration process was efficient; I was able to repeat the curriculum whenever it was necessary; Student-to-instructor interaction was more difficult than in other courses. Participants rated their responses for each of these 21 items using a 5-point Likert-type scale. These five response categories were coded from 1 to 5 with 1=strongly disagree, 2=disagree, 3=neither disagree nor agree, 4=agree and 5=strongly agree.

Furthermore, the fourth section of the survey poses the questions about which e-Class tools students consider helpful for them in order to be successful in physical education courses at Democritus University of Thrace. This section of the survey included an item listing 8 different functions such as: the course description tool, the agenda tool, the announcements tool, the documents tool, the self-evaluation exercises tool, the assignment tool, the forum tool and the chat tool. Items on the survey were measured on a 5-point Likert-type scale from 1 = never, 2 = rarely, 3 = occasionally, 4 = often, 5 = very often.

Data Collection

Data for this research was collected using an online questionnaire. An online questionnaire is a more efficient and economical way of collecting data from students in a university because most students today are avid users of the web. Communication using email is almost inevitable for faculty since almost all students are using such communication as a primary source for communication outside the classroom. Most university announcements and event updates are also communicated through the web or email communication, which make accessing the web and knowledge of email communication an inevitable tool for students.

The online questionnaire was designed in such a way that when participants first clicked on the link to the questionnaire, they were shown an informed consent letter explaining the purpose and structure of the questionnaire, their rights as participants, as well as any possible risk involved in participation of this research. In the letter, participants were also given the email address of the researcher in case there were other questions regarding the research that a participant wished to clarify. The email could also be used if a participant was interested in knowing the results of the research study.

The online questionnaire was divided into four different sections. After reading the informed consent letter, the participants were asked to indicate if they had ever used e-Class. Participants who have used or were using e-Class completed all four sections of the questionnaire. Participants who had never used e-Class or had never heard of e-Class were directed to only two sections of the questionnaire – demographic information, and skills with information technology. Both groups of participants completed the questionnaire in a section-by-section manner, that is, after the completion of one section, the participant was asked to click a *next* button to go to the next section, until all sections were completed. The questionnaire was also designed with an embedded program so that if a participant chose to skip any item, a remark designed using JavaScript appeared

requiring the participant to complete the missing item before he or she proceeded to the next section. After completion of the entire questionnaire, the participant clicked on a *submit* button, which sent the completed questionnaire to a secure server accessible only by the researcher. It was determined that participants would need approximately 30 minutes to complete all sections of this instrument.
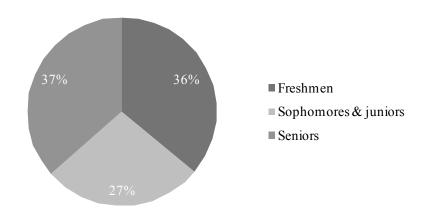
Results

Descriptions of the statistical procedures utilized in analyzing the data collected for this investigation are presented in this section. Data analysis was conducted using SPSS version 17 statistical software.

The statistical analysis included both descriptive statistics and inferential statistics. Descriptive statistics were provided to summarize the data and include measures of central tendency: mean, median, mode, and measures of variability (i.e., range, standard deviation) (Green & Salkind, 2007). Inferential statistics were based on the compare means. One-sample t test and t statistics were obtained. An alpha level of .05 was established prior to data analysis.

Demographics

Males comprised 71.1% (n=150) of the sample while females comprised 28.9% (n=61). Most participants were 22 years of age, the mean age was 21.6 (S.D. = 3.12) and the range was 19 to 24. The majority of the participants were seniors (36.5%) with sophomores & juniors making up the next largest group (36%). The remaining (24.6%) of the participants were freshmen. Figure 1 reports the percentages of participants associated with the academic year.

Figure 1. Percentages of participants in each academic year.

Information technology skills

Besides the demographic information, participants were asked to report their experience level on specific computer technologies and application. Table 1 shows the frequencies and percentages associated with the information technology skills. The most frequently occurring information technology categories were the word processing, communications systems and course management system, and the least common information technology categories were online library resources, graphics software and computer maintenance.

Table 1. Frequencies and percentages of information technology skills.

	Poor	Fair	Good	Very good	Excellent
Word processing (Word, etc.)	16 (7.6%)	30 (14.2%)	62 (29.4%)	75 (35.5%)	28 (13.3%)
Spreadsheets (Excel, etc.)	32 (15.2%)	75 (35.5%)	59 (28%)	28 (13.3%)	17 (8.1%)
Presentation software (PowerPoint, etc.)	36 (17.1%)	57 (27%)	52 (24.6%)	51 (24.2%)	15 (7.1%)
Graphics software (Photoshop, Flash, etc.)	61 (28.9%)	58 (27.5%)	52 (24.6%)	26 (12.3%)	14 (6.6%)
Communications systems (Internet, e-mail, chat, etc.)	21 (10%)	26 (12.3%)	57 (27%)	56 (26.5%)	51 (24.2%)
Online library resources	61 (28.9%)	64 (30.3%)	51 (24.2%)	28 (13.3%)	7 (3.3%)
Computer maintenance (Downloading updates, etc.)	63 (29.9%)	57 (27%)	37 (17.5%)	35 (16.6%)	19 (9%)
Course management system (e-Class, WebCT, etc.)	14 (6.6%)	38 (18%)	53 (25.1%)	64 (30.3%)	42 (19.9%)

Students' perception toward online CMS

One-sample *t* tests were conducted on the students' perception toward e-Class scores to evaluate whether their mean were significantly different from 2.5, the accepted mean for students at Democritus University of Thrace in general. The sample mean of 3.59 (SD = .69) was significantly different from 2.5, $t(210) = 22.80$, $p < 0.01$, concerning the *participation dimension*. The 95% confidence interval for the students' perception toward e-Class mean ranged from 3.49 to 3.68. The sample mean of *educational material dimension* ($M = 3.64$, $SD = .61$) was significantly different from 2.5, $t(210) = 27.08$, $p < 0.01$. The 95% confidence interval for the students' perception toward e-Class mean ranged from 3.56 to 3.73. Also, the sample mean of *usefulness dimension* ($M = 3.85$, $SD = .64$) was significantly different from 2.5, $t(210) = 30.78$, $p < 0.01$. The 95% confidence interval for the students' perception toward e-Class mean ranged from 3.76 to 3.93. Moreover, the sample mean of *user control dimension* ($M = 3.39$, $SD = .73$) was significantly different from 2.5, $t(210) = 17.76$, $p < 0.01$. The 95% confidence interval for

the students' perception toward e-Class mean ranged from 3.29 to 3.49. Finally, the sample mean of *interaction dimension* ($M = 3.56$, $SD = .66$) was significantly different from 2.5, $t(210) = 23.32$, $p < 0.01$. The 95% confidence interval for the students' perception toward e-Class mean ranged from 3.47 to 3.65. Table 2 shows the distribution of students' perception scores in each dimension. The results support the conclusion that participants had more positive perception than average in each dimension.

Table 2. Distribution of students' perception scores in each dimension.

	N	Mean	SD
Participation	211	3.59	.69
Educational material	211	3.64	.61
Usefulness	211	3.85	.64
User control	211	3.39	.73
Interaction	211	3.56	.66

Note. Test value = 2.5

Students' use of CMS tools

To understand which tools in the e-Class undergraduates used most often for their physical education courses, the survey included an item listing eight different functions (Table 3). The top choice was the *documents tool* ranging from "often" to "very often" in 74.4% of the participants and was followed by *announcement tool* (70.1%), *assignment tool* (63.5%), *self-evaluation exercises tool* (45.5%), *course description tool* (15.6%), *agenda tool* (12.3%), *discussion board tool* (6.6%) and *chat room tool* (6.2%).

Table 3. Frequencies and percentages of participants in each e-Class function.

	Never	Rarely	Occasionally	Often	Very often
Course description	41 (19.4%)	81 (38.4%)	56 (26.5%)	26 (12.3%)	7 (3.3%)
Agenda	63 (29.9%)	79 (37.4%)	43 (20.4%)	19 (9%)	7 (3.3%)
Announcements	4 (1.9%)	22 (10.4%)	37 (17.5%)	68 (32.2%)	80 (37.9%)
Documents	8 (3.8%)	17 (8.1%)	29 (13.7%)	54 (25.6%)	103 (48.8%)
Self-evaluation exercises	19 (9%)	41 (19.4%)	55 (26.1%)	45 (21.3%)	51 (24.2%)

Assignment	17 (8.1%)	27 (12.8%)	33 (15.6%)	51 (24.2%)	83 (39.3%)
Discussion board	80 (37.9%)	73 (34.6%)	44 (20.9%)	11 (5.2%)	3 (1.4%)
Chat room	104 (49.3%)	77 (36.5%)	17 (8.1%)	9 (4.3%)	4 (1.9%)

Discussion

The online CMS has become popular in recent years in higher education institutions due to the implementation of distance education in Greece. A research question was designed to understand how undergraduate students at Democritus University of Thrace perceived the utilization of the online CMS, e-Class in Physical Education courses. Analysis of the survey revealed a generally positive perception towards this particular online CMS. At this point, one may speculate whether or not the overall perception of e-Class was due to the limited CMS most students were exposed to. In other words, e-Class may be the only CMS most students are familiar with or have used.

Further analysis of the survey showed that the first dimension of the questionnaire, *participation,* had positive ranging from "3.49" to "3.68" on students' perception. This reveals that the on line CMS, e-Class allowed the students to become engaged in knowledge construction, sharing and reflecting the processes of their own work. The dimension *educational material* had positive ranging from "3.56" to "3.73". This indicates that the participants were satisfied with the amount and the clarity of the information received. The strong positive responses on the third dimension *usefulness* made it the most dominant in increasing "e-Class" perception. This shows that the execution and operation of e-Class was user friendly and the interface intuitive, and that it had helped to reduce both the faculty and the student's time in figuring out minute details of operation so that they were able to focus on teaching and learning. Also, the dimension *user control* had the smallest positive impact on students' perception toward the on line CMS, e-Class ranging from "3.29" to "3.49". The explanation to this phenomenon could be that on line instruction only focuses on learner's cognitive and motivational process while their emotional needs in the process of learning are left out. Finally, the last dimension, interaction had positive ranging from "3.47" to "3.65". This means that the particular on line CMS contained interactive features that would empower the learners to control the content and the flow of information and encouraged them to interact with the instructor or other learners. Such findings corresponded to the previous studies (Boggs, Shore & Shore, 2004; Jones & Jones, 2005), which indicated that students perceived the CMS as a beneficial tool for learning and positive to student's success of learning.

The perception ratings may be affected by a non-response bias. It could be that some students who were not satisfied with the courses choose not to participate in the study. Another consideration is that only students who completed at least one of the courses involved in the study were surveyed.

It is also important to note that the sample consists of slightly more men than women. This is noteworthy, given recent enrollment data that suggest women comprise the majority of postsecondary students (National Statistical Service of Greece, 2008). Thus, results from the present study should be interpreted in light of this limitation and generalizations may be limited to comparable samples.

Regarding the student's most frequently used tools in the CMS, the hierarchical order of the report was documents tool (74.4%), announcement tool (70.1%), assignment tool (63.5%), self-evaluation exercises tool (45.5%), course description tool (15.6%), agenda tool (12.3%), discussion board tool (6.6%) and chat room tool (6.2%). According to the data, it was likely that students used the CMS to read information content of uploaded documents, see class announcement, check grades and work on assignments. Course description, agenda, discussion board and chat room were four at the bottom of the list, which indicated that the students might not frequently used the CMS to read information about course goals, structure, teachers in charge, etc., check crucial course events in time order (lectures, meetings, etc) and communicate with classmates or teachers to exchange opinions about the course. This finding was consistent with the study done by Heaton-Shrestha, Gipps, Edirisingha, and Linsey (2007), in which the announcements and course documents were reported as the most used features in Blackboard, while the chat room was one of the least used, as well as the discussion board. The discussion above provides evidence that although e-Class might be quite commonly used, it might not have been utilized to its full potential.

Conclusion

The findings of the study provided information of the students' perceptions toward physical education courses using the online CMS, e-Class. Overall, participants in this study had positive perceptions toward e-Class and the results indicated that such systems were easy to use and advantageous in Physical Education learning and assisted them to develop their skills. Students' responses in the survey questions also supported the benefits of using the CMS for their learning.

Since the e-Class system was viewed as a beneficial tool for student physical education learning in the study, the administrators of the department of Physical Education & Sport Science at Democritus University of Thrace should take this online tool into consideration in the process of making administrative decisions, and the instructors should be encouraged to utilize the online CMS and the training program should be offered to stimulate both teachers and students' motivation of adopt the e-Class for Physical Education teaching.

References

Arbaugh, J. B. (2004). Learning to Learn Online: A Study of Perceptual Changes Between Multiple Online Course Experiences. *Internet and Higher Education, 7*, 169–182.

Arbaugh, J. B. & Duray, R. (2001). *Class Section Size, Perceived Classroom Characteristics, Instructor Experience, and Student Learning and Satisfaction with Web-based Courses: A Study and Comparison of two On-line MBA Programs.* In D. Nagao (Ed.), Proceedings of the Sixty-First Annual Meeting of the Academy of Management (CD), MED A1-A6.

Arbaugh, J. B., & Duray, R. (2002). Technological and Structural Characteristics, Student Learning and Satisfaction with Web-based Courses: An Exploratory Study of two On-line MBA Programs. *Management Learning, 33*(3), 331–347.

Billings, D. M., Connors, H. R., & Skiba, D. J. (2001). Benchmarking best Practices in Web-based Nursing Courses. *Advances in Nursing Science, 23*(3), 41–52.

Boggs, S., Shore, M., & Shore, J. (2004). Using E-learning Platforms for Mastery Learning in Developmental Mathematics Courses. *Mathematics and Computer Education, 38*(2), 213–20.

Bray, E., Aoki, K. & Dlugosh, L. (2008). Predictors of Learning Satisfaction in Japanese Online Distance Learners. *International Journal of Open and Distance Learning, 9*(3). Retrieved on December 17, 2008 from
http://www.irrodl.org/index.php/irrodl/article/viewFile/525/1154

Carvenale, D. (2005). Government's Request for Data may Delay Blackboard's Purchase of WebCT. *Chronicle of Higher Education, 52*(16). Retrieved December 26, 2008, from http://chronicle.com/weekly/v52/i16/16a02901.htm

Green, B. S., & Salkind, J. N. (2007). *Using SPSS for Windows and Macintosh: Analyzing and Understanding Data* (5th ed.). New Jersey: Prentice Hall.

Heaton-Shrestha, C., Gipps, C., Edirisingha, P., & Linsey, T. (2007). Learning and E-learning in HE: The Relationship Between Student Learning Style and VLE use'. *Research Papers in Education, 22*(4), 443–464.

Hutchins, H. M. (2001). Enhancing the Business Communication Course through WebCT. *Business Communication Quarterly, 64*, 87–94. Retrieved December 27, 2008, from http://bcq.sagepub.com/cgi/content/refs/64/3/87

Johnson, S. D., Aragon, S. R., Shaik, N., & Palma-Rivas, N. (2000). Comparative Analysis of Learner Satisfaction and Learning Outcomes in Online and Face-to-Face Learning Environments. *Journal of Interactive Learning Research, 11*(1), 29–49.

Jones, G. H., & Jones, B. H. (2005). A Comparison of Teacher and Student Attitudes Concerning Use and Effectiveness of Web-based Course Management Software. *Educational Technology and Society*, *8*(2), 125–135.

Kim, K. S. & Moore, J. L. (2005). Web-Based Learning: Factors Affecting Students' satisfaction and learning experiences. *First Monday, 10*(11). Retrieved on November 29, 2008 from http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1294/1214

Lee, C. Y., & Witta, L. E. (2001). *Online Students' Perceived Self-efficacy: Does it Change?* Atlanta, GA: The Annual Proceedings of the National Convention of the Association for Educational Communications and Technology. (ERIC Document Reproduction Service No. ED 470094).

Lim, C. K. (2001). Computer Self-efficacy, Academic Self-concept, and other Predictors of Satisfaction and Future Participation of Adult Learners. *The American Journal of Distance Education, 15*(2), 41–51.

National Statistical Service of Greece (2008). *Statistics in Higher Education: Academic Year 2006–2007.* Retrieved January 15, 2009, from http://www.statistics.gr/gr_tables/s806_sed_3b1_dt_an_06_y.pdf

Roach, R. (2006). Higher Education Software Giants Merge in Multimillion-dollar Deal. *Diverse: Issues in Higher Education. 23*(3), 28-30. Retrieved December 25, 2008, from http://search.epnet.com/login.aspx?direct=true&db=tfh&an=20403318

Shirvani, S. (2002). A Study of Factors Influencing Satisfaction with Distance Learning. *International Journal on e-Learning, 1*(2), 14–17.

Stein, D. (2004). Course Structure: Most Important Factor in Student Satisfaction. *Distance Education Report, 8*(3), 4.

Stein, D., Wanstreet, C., Calvin, J., Overtoom, C., & Wheaton, J. (2005). Bridging the Transactional Distance Gap in Online Learning Environments. *The American Journal of Distance Education, 19*(2), 105–118.

Stokes, S. P., (2003). *Temperament, Learning Styles, and Demographic Predictors of College Student Satisfaction in a Digital Learning Environment.* Biloxi, MS: The Annual Meeting of the Mid-South Educational Research Association. (ERIC Document Reproduction Service No. ED 482454).

Vernadaki, Z., Antoniou, P., Vernadakis, N., Giannousi, M. & Kioumourtzoglou, E. (2008). *Questionnaire Development for the Evaluation of the Asynchronous E-Learning Platform "E-Class" As an Instructional Tool Supporting the Traditional Method of Instruction.* Retrieved January 16, 2009, from http://www.phyed.duth.gr/eng/draseis/default2.aspx