

DISTANCE LEARNING APPROACHES IN TEACHER TRAINING

Variables Related To Teacher-Training Students' Preferences

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Abstract: Forty two teacher-training students participated in a 60 hour, year long teacher-training course that used two different distance learning approaches. Students worked in the first semester with synchronous Picture-Tel® videoconferencing, and in second semester with an asynchronous Internet based course. Their comparative satisfaction with each delivery system, and their comparative level of control of the learning process were examined. Results indicate that the interactive and asynchronous Internet Distance Learning approach contributes to a significantly higher level of satisfaction and higher level of control of the learning process than the interactive synchronous system. It is suggested that when the issue of introducing Distance Learning at the college level for teacher-training students is addressed, it is preferable to install an interactive Internet type method rather than a Picture-Tel® type system in order to best promote student satisfaction as well as student level of control of the learning situation.

Key words: distance learning, Internet, level of control, satisfaction, videoconference

1. DISTANCE LEARNING

The steady evolution of Information and Communication Technology (radio, television, interactive video, electronic mail, Internet and intranet) has influenced the development of Distance Learning (DL) at the tertiary level (McCullagh & Stacey, 1993). In the wake of the development of sophisticated third generation DL systems—which superseded previous DL approaches, and include interactive video, email, Internet, and intranet technologies—learning activity through the medium of these state-of-the-art DL systems has been redefined to include and focus on interactivity between

teachers and students (Trentin, 1997). Interactive videoconferencing, and interaction through the medium of Internet or intranet, offer one-to-many or one-to-one tuition in which teachers and students are able to communicate on-line thereby solving key instructional and learning problems in real time (Katz, 1998). Third generation DL systems are flexible and present teachers with the opportunity of continuously monitoring their students' overall progress. Carswell & Venkatesh (2002), Davies & Quick (2001), and Hwang, Shiu, Wu & Li (2002) indicated that, in particular, third generation systems that incorporate asynchronous features promote quality learning because of the flexibility of the system and the ability of the learners to learn according to their own personal schedule: an advantage not available in a synchronous system.

2. STUDENT SATISFACTION AND STUDENT CONTROL OF THE LEARNING PROCESS

Two major affective variables related to the instructional and learning processes are student satisfaction with learning, and student control of the learning process. Katz (1998) confirmed previous findings that student satisfaction with instructional and learning approaches is related to positive motivation to learn, as well as to higher levels of achievement. Katz pointed out that one of the key issues that contributes to student satisfaction is the level of interactivity present in the instructional and learning processes. Higher levels of interaction contribute to a higher rate of satisfaction as well as to higher levels of achievement.

In an additional study Katz (1994) examined the importance of student control of the learning process vis-à-vis the use of information technology as an instructional and learning methodology. Katz indicated that students who felt that they were in control of the learning process had more positive attitudes towards the use of information technology as an instructional and learning methodology and were more open to the use of computer-based approaches in the course of their studies than students who felt that they did not control the instructional and learning process.

3. UNIVERSITY AND SATELLITE COLLEGE DISTANCE LEARNING SYSTEMS

In Israel, a growing number of satellite university colleges have been established in peripheral towns and regional centers in order to cater for the

growing needs of the population. These colleges comply with the rigorous academic standards maintained by the sponsoring universities. However, there is a pronounced scarcity of fully qualified academic faculty members who are willing to teach at satellite colleges situated in towns geographically removed from the center of the country.

In order to overcome this problem the Bar-Ilan University established a sophisticated third generation DL system that connects the main university campus, with the Safed Regional College campus located 250 km. north of the university. The DL system connecting the university to the college incorporates two different interactive DL approaches. The first DL approach uses a synchronous Picture-Tel® interactive video system (Katz, 1998) that allows teachers and students situated in different locations to interact with each other in a situation similar to that existing in a traditional lecture hall. The second DL approach is based on interactive asynchronous Internet-based learning (Glave, 1998) through which coursework, generated at the main university campus, is presented to the students situated at the satellite campus or at their homes. In addition, the Internet system allows for asynchronous contact between the teacher who can enter an Internet forum connected to the course in order to view students' comments and requests. Both Picture-Tel® and Internet technologies are augmented by an email system available to teachers and students for communication in between lectures.

4. AIM OF THE RESEARCH PROJECT

The aims of this study were to examine teacher-training students' satisfaction with the synchronous Picture-Tel® videoconference and the asynchronous Internet Distance Learning systems that linked the Bar-Ilan University and the Safed Regional College, as well as to compare the level of control of the learning process experienced by teacher-training students who participated in the year-long 'Introduction to Teacher-Training' course, delivered by the two DL approaches.

5. METHOD

5.1 Sample

The research sample consisted of 42 first year teacher-training students who were registered in the School of Education at the Safed Regional

College. All of the students were accepted for study at the School of Education on the basis of two main criteria: a) achievement level attained in high school matriculation examinations, and b) college entrance psychometric examination scores. At the beginning of the 2002-2003 academic year, all 42 students registered for the mandatory 'Introduction to Teacher-Training' course. During the 15 week-long (30 hours) first semester, the 42 students studied through the medium of the synchronous Picture-Tel® DL videoconference system. During the 15 week-long (30 hours) second semester the students continued their studies in the same course through the medium of an asynchronous Internet approach as the course DL delivery platform. A senior lecturer was responsible for both semesters of the course and was fully familiar with instruction and learning through both the Picture-Tel® and Internet DL approaches.

5.2 Instruments

The Students' Satisfaction Questionnaire (Katz, 1998) is a 15 item questionnaire designed to examine the teacher-training students' satisfaction with DL systems. It was evaluated by three ICT educational experts and was adjudged to have face validity. The students' responses to the questionnaire items were factor analyzed in a principal components analysis. Eight items met the criterion of statistical significance (0.30) and were used in the statistical analysis of the research data. These items clustered around one significant factor that was labelled 'Student Satisfaction with Distance Learning'. This factor had a latent root of unity, and explained at least 10% of the variance. The alpha reliability coefficient of the 'Student Satisfaction with Distance Learning' variable in the present study reached the 0.91 level.

The Students' Level of Control of Learning Questionnaire is also a 15 item questionnaire designed to examine the students' feelings about their level of control of the learning process. It was evaluated by three ICT educational experts and was adjudged to have face validity. The students' responses to the questionnaire items were factor analyzed in a principal components analysis. Eleven items met the criterion of statistical significance (0.30) and were used in the statistical analysis of the research data. The 11 items clustered around 1 significant factor that was labeled "Level of Control of Learning". This factor had a latent root of unity and explained at least 10% of the variance. The alpha reliability coefficient of the "Level of Control of Learning" variable in the present study reached the 0.86 level.

The two research instruments were administered to the students at the end of the first semester of the 2002-2003 academic year to examine their satisfaction and level of control of the learning process after studying by way

of the Picture-Tel® DL configuration and again at the end of the second semester of the same academic year in order to examine their satisfaction and level of control after studying through the medium of the interactive Internet DL approach.

5.3 Procedure

During the first semester, the synchronous Picture-Tel® DL system was used to deliver weekly lectures to the 42 students in a suitably equipped lecture hall at the Safed college campus. During the second semester the students were able to login asynchronously to the Internet based course at any time from their homes or from the college. The course included lectures, relevant texts and revision exercises. In addition they could log in synchronously to Internet chat and forum sessions held by the lecturer for those who needed additional assistance with their coursework. During both semesters all participating students were required to communicate at least once weekly with the lecturer by way of email as a secondary and complementary learning methodology.

6. RESULTS

Means and standard deviations for the 'Student Satisfaction with Distance Learning' variable for each Distance Learning methodology were computed from data collected from the research questionnaire administered to students who participated in the year-long Introduction to Teacher-Training course. Thereafter student scores for the Student Satisfaction with Distance Learning variable for each Distance Learning methodology were compared in a paired samples t-test. Descriptive data and paired samples t-test results are presented in Table. 1.

Table 1. T-test results (paired samples) on Student Satisfaction with Distance Learning Variable (N=42)

D.L. Methodology	N	Mean	S.D.	D.F.	t	P
Internet	42	33.11	3.10	41	5.96	P<0.001
Picture-Tel®	42	28.47	3.98			

From the results of the t-test, the existence of a significantly higher level of student satisfaction with the Internet-based methodology is indicated on the 'Student Satisfaction with Distance Learning' variable. It is apparent that the Internet-based learning system engendered a significantly higher level of satisfaction among the students than the level of satisfaction derived from the Picture Tel® videoconference system.

Means and standard deviations were computed for the 'Level of Control of Learning' variable for each DL methodology. Thereafter, student scores for the Level of Control of Learning variable for each DL methodology were compared in a paired samples t-test. Descriptive data and paired samples t-test results are presented below in Table 2.

Table 2. T-test results (paired samples) on Level of Control of Learning Variable (N=42)

D.L. Methodology	N	Mean	S.D.	D.F.	t	P
Internet	42	38.69	4.59	41	4.88	P<0.001
Picture-Tel®	42	35.30	3.77			

From the results of the t-test the existence of a significantly higher level of control by teacher-training students is indicated on the 'Level of Control of Learning' variable when DL instruction was conducted through an Internet-based approach. It is apparent that the Internet-based approach engendered an enhanced feeling of control of learning among teacher-training students that was significantly higher than the level of control of learning perceived when studying through the medium of Picture-Tel® Distance Learning methodology.

7. DISCUSSION

It is apparent that during the second semester study in the course that used an asynchronous Internet-based DL methodology, the students were significantly more satisfied with the learning and instructional process than they were during first semester study which was used the synchronous Picture-Tel® DL system. It appears that the asynchronous Internet-based approach, which is sophisticated and highly interactive but flexible and suited to the students' personal schedules, allows tutors and students with instructional and learning opportunities to better deal with the study material than those presented by the synchronous Picture-Tel® system. While this closely resembles a regular classroom, it is not flexible in accommodating

the students' personal schedules. Those students who studied through the videoconference-based course indicated a lower level of satisfaction with this mode of study than those utilizing the Internet methodology. This is probably because the student-teacher interaction is more flexible and intense in an Internet course. The Internet DL approach apparently offers learning and instructional advantages because of the intensity of the asynchronous interaction between students and teachers. As a result, it seems that the students are more reserved about their level of satisfaction with the synchronous Picture-Tel® videoconference system than with the Internet-based methodology.

Additional statistical analysis indicates that the students' feelings about the Level of Control of Learning variable were significantly more positive when they studied the course during the second semester through the use of Internet-based DL method than when they studied the same course during the first semester through the Picture-Tel® DL system. It appears that the asynchronous Internet-based approach contributes to a more flexible, natural and relaxed instructional and learning atmosphere which in turn leads to a feeling of more comprehensive control of the learning process than that generated through the synchronous Picture-Tel® DL approach which is apparently compromised somewhat by objective technological limitations. The perception of the students that the Internet-based system allows for more flexible and intensive student-teacher interaction conceivably leads them to feel a greater measure of control of the learning process than when study is conducted through a synchronous medium such as with the Picture-Tel® videoconference system.

8. CONCLUSION

The results show that a flexible and interactive asynchronous DL system that allows for intensive student-teacher interaction is best. It is also best suited to contribute significantly to student satisfaction, and to a feeling of control of the learning process. Systems that provide synchronous interaction, and which may be between teacher-training students and their instructors are less able to engender either student satisfaction or a feeling of control of learning. The present study clearly indicates the comparative advantages of an Internet-based asynchronous approach over a Picture-Tel® type synchronous videoconference configuration. Thus, despite the heavier work-load associated with using an asynchronous Internet based system, the Internet based system is more highly recommended as a Distance Learning approach than the videoconference-based learning method.

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BIOGRAPHY

Professor Yaacov Katz is the Director of the Institute for Community Education and Research at Bar-Ilan University and Chair of the Pedagogic Secretariat of the Israeli Ministry of Education, Culture and Sport. He specializes in research on the attitudes of students and teachers towards the use of ICT in Education and has published widely in this area.