COMPUTERIZED TEACHING USING THE ENVIRONMENT WEB SITE – RESEARCH FINDINGS

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ABSTRACT
"The Environment" site is a joint project of three teacher-training colleges (Kibbuzim, Oranim and Orot Israel). The site combines guided self-learning in a computerized setting, with information and knowledge sharing between teachers and students in these colleges. The development of the Environment site was accompanied by research that evaluated the effect of a computerized course on students' attitudes to learning blended with the Internet. The research took place during 2000-2001. The subjects were students and teachers enrolled in ecology and environment courses that utilize the Environment site in the teaching process. The research checked the personal expectations of students from computer-assisted learning and students' attitudes to integrating the Internet in teaching, on computerized courses and on Internet-assisted learning. In their responses, students attributed a high value to the contribution of computerized learning to personal development (improved learning, widening of knowledge and independent learning). No significant difference was found in the pre- and post-test personal expectations levels. With respect to opinions concerning the integration of computers into learning, the evaluations were found to be higher after the course than before. More students think that the Internet should be incorporated into school teaching, and expressed their intention to put it to use in their teaching. Internet-assisted learning is perceived as more motivating and more students were interested in adding computerized courses after they participated in the course, relative to their opinions at the beginning of the course. A comparison of the findings of the years 2000 and 2001 revealed significant differences in the characteristics of computer and Internet skills, however, the research questions showed the same trends. The research findings encourage developing more computer-integrated courses. They underscore the need to examine interactive computerized activities, distance learning and the effect of exposure to computerized courses on teacher-trainees and teachers in the field. [The Environment site: http://ichut.macam.ac.il/main.htm]

KEYWORDS
Internet, Information and Communication Technologies (ICT), Web-based course, teacher education, ecology, environmental course, attitudes, computer, web-based learning

INTRODUCTION

The use of the Internet in education is growing rapidly. According to the US National Center of Education Statistics - 2001, by 2000, 98% of public schools in United States had access to the Internet, in comparison to 35% of public schools that had access to the Internet in 1994.

The emergence of the Internet and other technologies in schools is changing the way to define literacy by introducing teachers and students to a wealth of electronic texts (Reinking, 1998).
These changes are forcing teachers to take into consideration the new forms of literacy and reevaluate course curricula. Generally, experienced teachers are those who employ technologies to accomplish their educational agendas (Bruce, 1997).

There is a strong need to educate teachers on integrating Information and Communication Technologies (ICT) in their teaching. Therefore educational institutions are encouraging teachers and faculty to develop Web-based courses (Davis, 2000; Vrasidas, 2002).

"The Environment" Web site is a joint project of three teacher education colleges in Israel. The site combines guided self-learning in a computerized setting, with information and knowledge sharing between teachers and students in these colleges. It contains abundant textual and visual information on environmental topics, a glossary, educational activities and reports on environmental hazards written by students and lecturers of the colleges.

During the courses which were carried on in classroom the students practiced skills for using the Internet and specifically "The Environment" Web site as source of scientific information, links list and online database.

The study reported in this article examines the personal expectations of students from computer-assisted learning and students' attitudes to integrating the Internet in teaching. Understanding student attitudes toward Web-based learning and teaching will assist in creating a better teacher education program in the colleges.

METHODOLOGY

Participants and Overview

The present study was conducted during the years 2000-2001. 130 students from two teacher education colleges participated in the study (77 students in 2000 and 53 students in 2001). All of them studied ecology and environmental courses based on "The environment" Web site. The purpose of the course was to teach the students environmental and ecological issues by integrating Internet and communication skills in teaching.

Questionnaires

Two questionnaires were used in the present study:

Attitudes toward computer-assisted learning.

The questionnaire consisted of 24 items rated on 4-points Likert type scale from: 1(=strongly disagree) to 4(=strongly agree).

The items were divided into 4 categories (Two items for each category are presented).

- Personal expectations of using the Internet.
  - Learning with the Internet will improve my English.
  - The Internet will widen my knowledge.
- Attitudes toward integrating the Internet in teaching.
  - I intend to use the Internet when I will teach.
  - I think that it is important to use the Internet in school.
- Attitudes toward using the Internet as a learning environment.
  - The learning process with the Internet is interesting.
  - I would like to attend more Web-based courses.
- Difficulties in using the Internet.
  - I waste more time on searching the Web than on learning.
  - The Internet is addictive.

The internal consistency of each of the four scales was tested. The Cronbach alpha coefficients were 0.76, 0.73, 0.68, and 0.57 respectively, these results approved the questionnaire reliability.

Perceived Internet and Computer Skills

A questionnaire assessing their perceived capability of using the ICT was used. The questionnaire consisted of 10 items reflecting various activities with word processing software, electronic mail, and electronic databases etc. The items were rated on 4-points Likert type scale from: 1(=none) to 4(=high).

Research Design
A 2x2 split-plot design was used: (1) Time – two repeated measurements of attitudes. In order to examine the effect of the course on the students' attitudes, the questionnaire was administered twice – before and after the course. (2) Perceived capability of using ICT – high and low. In order to examine whether students with high perceived self-capability of using ITC have different attitudes toward the use of Internet for learning, students were divided into two groups according to their score on the relevant questionnaire.

RESULTS

Table 1 shows the results of the perceived ICT skills survey administered to students. The table demonstrates that relatively more students in the year 2001 (compared to 2000) perceived themselves as having high capability of using the Internet.

Table 1. Percentages of students with high versus low perceived capability of using ICT

	2000	2001
High perceived capability	45%	70%
Low perceived capability	55%	30%

Table 2. Students' personal expectations of using the Internet, comparison of students with high and low perceived capability of using ICT

Academic Year		High perceived capability		Low perceived capability		P
		Mean	SD	Mean	SD	
2000	Pre-course	3.26	0.59	3.04	0.52	0.161
	Post-course	3.33	0.54	2.66	0.33	0.001
2001	Pre-course	3.26	0.59	3.25	0.55	0.963
	Post-course	3.05	0.61	3.18	0.45	0.440

Notes: SD = standard deviation; P = probability

Table 2 displays the means ratings of personal expectations of using the Internet. The table shows that in general all the students had relatively high expectations. Furthermore, the analysis of variance performed on these data yielded only one main effect of high vs. low perceived capability. In other words, students with high capability in 2000 (post –course) had higher expectations of using the Internet ($p< 0.05$).

Table 3 presents the students' attitude toward integrating Internet in teaching. The analysis of variance conducted on this table yielded effect of time. More specifically, students with high perceived capability had higher evaluation of the importance of integrating the internet in teaching as compared to the low capability students. However, in this measure, the differences reached the significance level in the year 2000 only on both tests.

Table 3. Attitudes toward integrating the Internet in teaching.
A comparison between students with high and low perceived capability of using ICT

Academic Year		High perceived capability		Low perceived capability		P
		Mean	SD	Mean	SD	
2000	Pre-course	3.08	0.62	2.66	0.71	0.031
	Post-course	3.40	0.52	2.71	0.45	0.001
2001	Pre-course	3.11	0.54	2.97	0.51	0.370
	Post-course	3.12	0.60	3.16	0.55	0.840

Notes: SD = standard deviation; P = probability

The results of the comparison between attitudes before and after the course among all the participants are shown in table 4. Analysis of variance was conducted on this table and the only significant difference was in students' attitudes toward using the Internet for learning. In 2000, after the course the students' score was higher than before.

Table 4. Comparison between the research variables – Pre-course and Post-course

Category	Year	Pre-course		Post-course		P
		M	SD	M	SD	
Personal expectations	2000	3.15	0.56	3.04	0.50	0.317
	2001	3.2	0.58	3.08	0.56	0.120
Integrating the internet in teaching	2000	2.86	0.70	3.07	0.52	0.070
	2001	3.0	0.52	3.13	0.57	0.120
Internet as a learning environment	2000	2.83	0.77	3.21	0.52	0.004
	2001	3.06	0.64	3.14	0.69	0.460
Difficulties in using the Internet	2000	1.80	0.49	1.87	0.47	0.450
	2001	1.9	0.49	2.02	0.46	0.130

Notes: SD = standard deviation; P = probability

Pearson correlation analysis between the research variables in the year 2000 (table 5) showed a significant positive correlation between the variables: Personal expectations, Attitudes toward integrating the Internet in teaching and Attitudes toward using the Internet for learning before and after the course. However, there is no significant correlation between these three variables and Difficulties in using the Internet. The same results were found in the study in the year 2001 (table 6).

Table 5: Pearson correlation between the research variables, Pre-course and Post-course in 2000

	Expectations Pre-course	Expectations Post-course	Integrating in teaching Pre-course	Integrating in teaching Post-course	Internet as a learning environment. Pre-course	Internet as a learning environment Post-course	Difficulties Pre-course	Difficulties Post-course
Expectations Pre-course	1							
Expectations Post-course	0.415*	1						
Integrating in teaching Pre-course	0.683**	0.523**	1					
Integrating in teaching Post-course	0.475*	0.720**	0.621**	1				
Internet as a learning environment Pre-course	0.669**	0.467*	0.497**	0.366	1			
Internet as a learning environment Post-course	0.555**	0.514**	0.565**	0.471**.	0.565**	1		
Difficulties Pre-course	-0.152	-0.263	-0.160	-0.210	-0.160	-0.116	1	
Difficulties Post-course	-0.044	-0.043	-0.097	-0.005	-0.970	0.097	0.681**	1

* P< 0.05 ** P<0.01

Table 6. Pearson correlation between the research variables, Pre-course and Post-course in 2001

	Expectations Pre-course	Expectations Post-course	Integrating in teaching Pre-course	Integrating in teaching Post-course	Internet as a learning environment Pre-course	Internet as a learning environment Post-course	Difficulties Pre-course	Difficulties Post-course
Expectations Pre-course	1							
Expectations Post-course	0.626**	1						
Integrating in teaching Pre-course	0.633**	0.604**	1					
Integrating in teaching Post-course	0.511**	0.650**	0.551**	1				
Internet as a learning environment Pre-course	0.643**	0.433**	0.538**	0.344*	1			
Internet as a learning environment Post-course	0.552**	0.777**	0.560**	0641**.	0.460**	1		
Difficulties Pre-course	-0.029	0.042	0.101	0.089	-0.217	0.036	1	
Difficulties Post-course	-0.142	-0.275*	-0.054	-0.275*	-0.057	-0.233	0.557**	1

* P< 0.05 ** P<0.01

DISCUSSION

The competence of students in using Information and Communication Technologies (ICT) was found to be higher in the year 2001 than in 2000, but in 2001, 30% of the students participating in the study still defined their level as low. There are significant differences in attitudes between students with low perceived capability and students with high perceived capability of using the computer and Internet. Students with low perceived capability had low personal expectation after the course and their readiness to integrate ICT in teaching is also low. These results emphasize the necessity to improve students' skills in using ICT as a part of their training.

In their responses, students attributed a high value to the contribution of Web-based learning to personal development (improved learning, widening of knowledge and independent learning).
Most students have positive attitudes toward integrating the Internet in teaching and they appreciate the benefits of studying with the Internet. Internet-assisted learning is perceived as more interesting and as a result, more students were interested in adding online courses after they participated in the course, relative to their opinions at the beginning of the course.

Are these positive attitudes indicating that as teachers these students will implement ICT in class?

The results of the category: ”Difficulties in using the Internet” reflects the awareness to the disadvantages of surfing on the Web such as: time consuming, addicting etc. Therefore it is surprising that there is no correlation between the students’ opinions about the difficulties in using the Internet as a learning environment and their attitudes toward using the Internet for teaching and learning.

In the study there were no significant changes in all the research parameters in 2001 concerning the comparison between attitudes prior to and at the end of the course. In 2000 there was a significant change only in the parameter Attitudes toward using the Internet as a learning environment. These results may be due to the fact that for most students it was their first Web-based course. Their high expectations were expressed in the pre-course test as most categories score was high (>3).

Most college students use computer technology to some extent, so it is not surprising that there was no change in their attitudes following the course. The same trend has been described in other researches (Willis and Sujo de Montes, 2002). According to Weiman (2000) it is complicated to investigate the influence of the Internet, as this field continually undergoes developments and is rapidly changing. In 2001 more students used computer communication in daily life. This may also explain the differences in the percentages of students with high versus low perceived capability of using the ICT between 2000 and 2001.

The research findings encourage developing more Web-integrated courses. They underscore the need to examine interactive computerized activities, distance learning and the effect of exposure to computerized courses on teacher-trainees and teachers in the field, both from the point of view of using the Internet to prepare materials and communication with colleagues, and also to classroom teaching.

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