On the Attitudes of Construction Technology Students towards Information and Communication Technology

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Abstract
Integrating Information and Communications Technology into education seems to be an important study area for education researchers in the world. However, if teachers cannot make effective use of the information and communications technology tools, the contribution of this subject to education is going to be a waste. In this study, it is analyzed that the attitudes of Construction TechnologyStudents from a Vocational High School towards a specific type of technology based learning, that of Online Web-Assisted Learning.

Data were collected to examine differences in attitudes between traditional learning (teacher centered instruction) and Online Web-Assisted Learning, of differences in attitudes towards Online Web-Assisted Learning between males and females, the correlation between Internet use and Online Web-Assisted Learning attitudes, and the items that students find fascinating in Online Web-Assisted Learning.The research study has generated a number of outcomes to the research question and the results indicate that some students engage in and accept the use of Online Web-Assisted Learning to supplement their learning.

Keywords: information and communications technology, e-learning, students' attitude, instructional technology program

Introduction
The term online learning (or, distance learning) includes a number of computer-assisted instruction methods. Online teaching and learning is classroom-delivered instruction via the Internet. Online instruction includes real-time (synchronous) and anytime, anywhere asynchronous) interactions (Vry at al., 2000). According to Feenberg (1998), two parallel processes take place in an online environment:

- Students become more active, reflective learners.

- Students and teachers engage in learning through the use of technology and become more familiar with technology by using it.

He stressed that 'online learning is most effective when delivered by teachers experienced in their subject matter. The best way to maintain the connection between online education and the values of traditional education is through ensuring that online learning is "delivered" by teachers, fully qualified and interested in teaching online in a web-based environment'. Online Web Learning (OWL) has turned out as one of the fastest moving trends in education today (Palmer et al., 2001).

Instructors have interaction with students by face to face at a classroom in traditional education system. When the electronic communication tools are coming in the world technology, the way of life is becoming to change in various ways and at various areas. The term "e-learning" has been thrown around a wide using in recent years, many people in education family are still unaware of what it actually means and how it can help them achieve success in the education and social life. When e-learning comes to education system, teaching was in a classroom of students and a teacher who led the educational activities. At that times, any type of learning was questionable at best. Then the computer evolution happened and it radically changed the learning approaches. the quest for e-learning (electronic-learning), that is, using a computer to aid in the learning process, at the school level had been usable in the 1980's (Hong at al., 2001). Move clearly, e-learning is a computer based educational tool or system that enables people to learn anywhere and at any time. But, today e-learning is mostly delivered though the internet connection, although in the past it was delivered using a blend of computer-based methods like CD-ROM or hard disk.

Using of an important technological material in schools has made many positive impacts and developments into teaching and learning. However, it can be said the adaptation of Information and Communication Technologies (ICT) into schools has been slow. However, Woodrow (1991) noticed that teacher and student attitudes for this system was significant for acceptance, success and developing of the new system. Paris (2004) give a figurative classification of E-learning that covers a broad area within ICT Education and comes in many media formats as seen in Table 1 (Paris, 2004).

Table 1. **A figurative classification of E-learning**
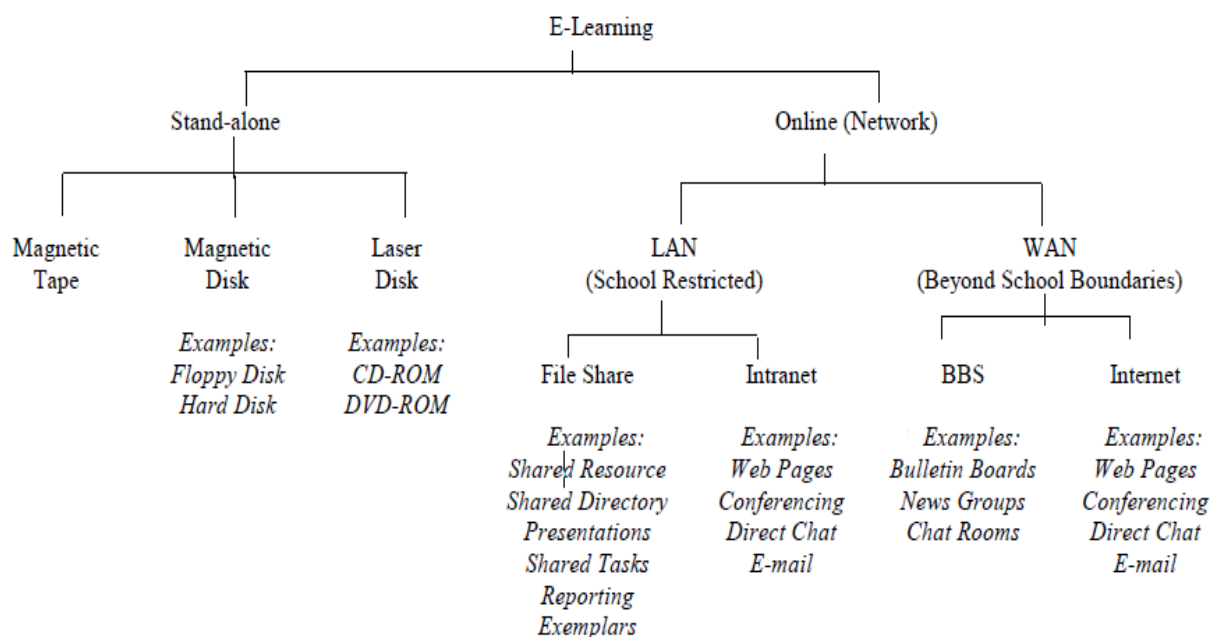
An important approach for the key concept 'E-learning' was made by Hong at al., (2001); if a computer is used in teaching, then educational format is Computer Learning (CL). It can be used as two way that;

- Computer Based Learning (CBL), which involves the computer taking the place of the teacher as in distance education
- Computer Assisted Learning (CAL), which involves a teacher using electronic materials about the lecture to make more efficient his/ or her face to face teaching.

In CL, if the computer in the class networked to the Internet with web page access, then Computer learning is expressed as Online Web Learning (OWL). It can be used as two way that;

- Online Web Based Learning (OWBL)
- Online Web Assisted Learning (OWAL)

A figurative version of Hong and his friends' approach explained about is presented in Tablo 2 and Tablo 3, (Paris, 2004).
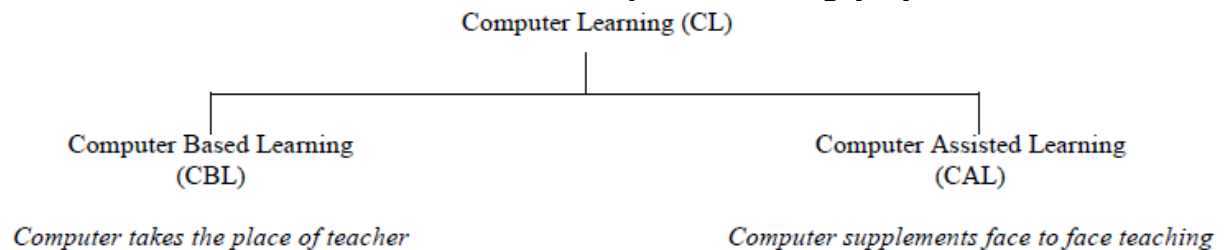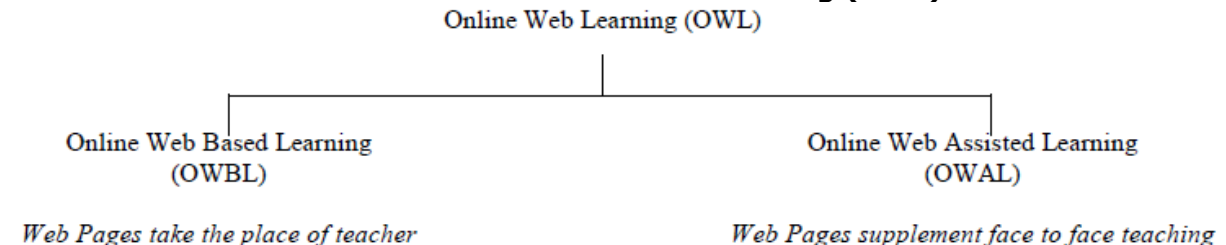
Table 2. Parts of computer learning (CL)

Table 3: Parts of online web learning (OWL)

Trollip and Alessi (1991) noticed some valuable recommendations about developing good e-learning material for students. They consider the following publishing elements:

- Text: "A critical factor affecting the quality of a (e-learning) tutorial is the length of information presentation"
- Graphics and Animation: "Pictures, especially animated ones, capture attention more than text"
- Color: "Color is effective for attracting attention"
- Transitions: "It is difficult for a student to distinguish a change in display that represents a continuation, from one that represents changing to an entirely different topic, the equivalent of changing chapters in a book"
- Help Menus: "(Students) … frequently need help of two types, procedural and informational"
- Questions and Responses: "A lesson which presents information without demanding interaction with the student will not be successful"

Method

Sixty-one students (34 males and 16 females, 68% and 32%, respectively) from the Construction Technology department from a vocational high school selected for the study. The students were grouped into two subgroups of 61 students. Basic Information Technology text book (Yıldız at al., 2006) was used to each subgroup in every week at one semester (PAL activity) in the Basic Information Technology Lecture of the program. An OWAL activity was administered that involved multiple linked web pages as its resource. Both the PAL and OWAL activities included colorful photos and graphics. the web pages also included animation and sound presentations in OWAL (Paris, 2004). *There is a unique application difference between the subgroups of the program;* in the lectures of one subgroup, PAL activities were applied activity first; for the second subgroup, the OWAL activities were first

At the end of the semester, the students were applied to an online questionnaire. This questionnaire had four sections of the different information gathered from the students (Paris, 2004):

- Section 1: student personal details and ICT experiences;
- Section 2: students' "behavioral attitudes" towards OWAL;
- Section 3: the "affective attitudes" of students;
- Section 4: the students' "cognitive attitudes".

The items for the questionnaire were obtained from two sources;
One source came from responses provided by a group of 25 randomly selected the program students. The students were asked to provide a written response to two open-ended questions as follows:

1. When learning for school work, which do you enjoy the most; a book or a Web Site?
2. If you have answered a Web Site, then please continue by answering the following question: What makes learning from a Web Site more enjoyable?

The other source came from the Jones and Clarke's (1994) Computer Attitude Scale (CASS). The scoring for the questionnaire was established as follows: Strongly Agree: 5 points; Agree: 4 points; Undecided: 3 points; disagree: 2 points, and; strongly disagree: 1 point. In the questionnaire, each of the item codes used in the data collection are presented in Table 4 (Paris, 2004).

The Affective and Cognitive Attitudes (14 and 15 items, respectively) of students have a good internal consistency of 0.85 and 0.83 respectively. That is, the items used to determine these attitudinal components were very reliable. However, the Behavioral Attitudes of students (14 items), the Cronbach Alpha Coefficient was 0.62 (Paris, 2004). The 5-point Likert Scale used in the research questionnaire may have contributed to the low Cronbach value (Palmer, 2001).

The classification of dependence between questionnaire items and the research questions are given Table 5 (Paris, 2004).

Table 4. Definition of Questionnaire Item Codes

Code	Questionnaire Items
P1	Indicate your gender
P2	Indicate your age group
P3	How many computers do you have at home?
P4	Do you have access to a computer at school to do your school work?
P5	Do you have access to a computer in the classroom for school work
P6a	Do you have access to the Internet at home?
P6b	If YES to P6 - How often do you use the Internet for chatting (such as ICQ)?

P6c	If YES to P6 - How often do you use the Internet for school work?
6d	If YES to P6 - How often do you use the Internet for playing games?
P7a	Do you have your own email account?
P7b	If YES to P7 - How often do you use the Internet for e-mailing?
B1	I have problems using the mouse when using Web Pages
B2	I have problems using the keyboard when using Web Pages
B3	I have problems using the scroll bars on the Web Pages
B4	If given a choice I would first search for a book to find information for a school project before I search for a Web Site
B5	If given a choice I would get most of my diagrams for school projects from a text book than a Web Site
B6	I avoid using Web Sites whenever I can
B7	I have problems finding my way around a Web Site
B8	I learn to use new Web Sites by trial and error
B9	Other students look to me for help with Web Sites
B10	Using Web Sites has increased my interaction with other students
B11	I develop shortcuts, and more efficient ways to use Web Sites
B12	When I have a problem with a Web Site, I usually solve it on my own
B13	I can adjust Web Pages (such as Font sizes) to suit my needs
B14	I download objects (such as pictures and sound) from a Web Site for school use
F1	The Web Assisted activity terrified me
F2	The colors on the Web Assisted activity made it more interesting than the colors on the Paper Assisted activity
F3	I preferred the Web Assisted activity instead of the Paper Assisted activity because it had animation
F4	I preferred the Web Assisted activity instead of the Paper Assisted activity because it had sound
F5	I felt more uncomfortable using the Web Assisted activity than the Paper Assisted activity
F6	I found the Web Assisted activity more boring than the Paper Assisted activity
F7	School work that uses Web Sites for learning makes me feel happy
F8	If I had a choice I would prefer to learn from a book than from a Web Site
F9	I feel helpless when asked to use Web Sites for school work
F10	I feel confident with using Web Sites
F11	I feel threatened when others talk about Web Sites
F12	Web Sites frustrate me
F13	I preferred the graphics on the Web Site better than the graphics on the Paper Assisted activity
F14	I get a sinking feeling when I think of trying to use a Web Site
O1	The Web Assisted activity was easier to use than the Paper Assisted activity
O2	The Web Assisted activity was more difficult to read than the Paper Assisted activity
O3	The Web Assisted activity was more difficult to understand than the Paper Assisted activity
O4	Web Sites will take over Books in the future
O5	Working with Web Sites will not be important to me in my career
O6	There should be more school work that uses Web Sites
O7	All subjects in the future will use Web Sites for learning
O8	Students learn more using Web Assisted activities than Paper Assisted activities
O9	Web sites are difficult to learn from
O10	Finding your way around a Web Site is harder than finding your way around a Book
O11	Boys like using Web Sites more than girls do
O12	People who use Web Sites for work are seen as being more important than those who don't
O13	Working on Web Sites means working on your own, without contact with others

O14   To use Web Sites, you have to be highly qualified
O15   Learning from a Web Site is enjoyable because some include games and movies
P = Personal, B = Behavior (Behavioral), F = Feelings (Affective), O = Opinions (Cognitive)

Table 6: The classification of questionnaire items and the research questions

Research Questions	Questionnaire Items
Differences in attitudes between PAL and OWAL	B4, B5, F1, F2, F3, F5, F6, F8, F13, O1, O2, O3, O4, O8, O10
Differences in attitudes towards OWAL between males and females	P1, P2, P3, P4, P5, P6, P7, F3, F5, F6, F7, F8, F9*, F10, F11*, F12*, F13, F14*, O1, O5*, O6, 011*, O13*, O15
*Correlation between Internet use and positive OWAL attitudes	P3, P4, P5, P6, P7, B1, B2, B3, B6, B7, B8*, B9*, B10*, B11*, B12*, B13, B14, F7, F8, F9*, F10, F11*, F12*, F14*, O5*, O6, O7, O9, O12*, O13*, O14*
*Publishing Elements that students find most appealing in OWAL	B5, B13, B14, F2, F3, F4, F13, O15

Analyze of the research question is not added in this paper.

Findings
Student Attitudes towards OWAL

Table 7.Mean ratings of attitudes to questionnaire Items

	Behavior			Affective			Cognition	
Code	Male	Female	Code	Male	Female	Code	Male	Female
B1	4.6	4.3	F1	4.0	3.6	O1	3.9	3.8
B2	4.4	4.2	F2	3.7	3.5	O2	3.8	3.9
B3	4.0	4.2	F3	3.6	3.7	O3	3.2	3.7
B4	4.2	4.0	F4	3.6	3.2	O4	4.0	3.9
B5	4.4	4.4	F5	3.4	3.7	O5	4.2	4.0
B6	4.4	3.9	F6	3.8	3.8	O6	4.2	4.1
B7	4.2	3.9	F7	3.6	3.9	O7	3.9	4.1
B8	3.9	3.7	F8	4.2	4.2	O8	3.6	3.8
B9	3.7	3.6	F9	4.6	4.5	O9	3.9	4.1
B10	3.7	3.5	F10	4.7	4.4	O10	3.9	3.7
B11	3.3	3.5	F11	4.2	4.0	O11	4.2	3.9
B12	3.5	3.8	F12	4.1	4.0	O12	4.4	4.1
B13	3.9	3.3	F13	4.4	4.3	O13	4.3	4.0
B14	3.7	4.0	F14	4.6	4.4	O14	3.9	3.8
						O15	4.0	4.1

According to the Table 7 provides an overall summary of the results from the questionnaire. As an example, it can be seen from questionnaire item coded B6 of "Behavioral" that the males Mean rating was 4.4 while the females Mean rating was 3.9, questionnaire item coded F12 of "Affective" that the males Mean rating was 4.1 while the females Mean rating was 4.0 and questionnaire item coded O2 of Behavioral that the males Mean rating was 3.8 while the females Mean rating was 3.9. From these score, we can say that both males and females rated OWAL favorably.

Differences in attitudes between PAL and OWAL
Table 8 shows that there is a strong positive tendency by students towards OWAL. It clearly appears that students prefer OWAL because they can get most of the diagrams required for school projects more readily from an Internet site than from a text book

(B5, Table 8), they find the graphics on a Web site more appealing (F13, Table 8), students believe they can find additional information more easily from the Internet (B4, Table 8). Their average of that "The Web assisted activity was more difficult tounderstand than the Paper Assisted activity", (O3, Table 8) is fortypercent, and seventy-one percent of the students believed that OWAL will replace books in schools in the future (O4, Table 8) and fifty-three percent of the students enjoyed the fact that OWAL has animations (F3, Table 8).

Table 8. Differences in Attitudes towards PAL and OWAL (N=50)

Code	Questionnaire Item	Mean Rating	Frequency (%)				
			SD	D	U	A	SA
B4	If given a choice I would first search for a book to find information for a school project before I search for a Web Site	4.2	0	8	10	38	45
B5	If given a choice I would get most of my diagrams for school projects from a text book than a Web Site	4.4	0	4	12	33	52
F1	The Web Assisted activity terrified me	3.9	2	9	41	26	23
F2	The colors on the Web assisted activity made it more interesting than the colors on the Paper Assisted activity	3.6	5	19	34	25	18
F3	I preferred the Web Assisted activity instead of the Paper Assisted activity because it had animation	3.6	4	9	36	26	28
F5	I felt more uncomfortable using the Web Assisted activity than the Paper Assisted activity	3.5	3	12	37	24	26
F6	I found the Web Assisted activity more boring than the Paper Assisted activity	3.8	5	6	39	27	24
F8	If I had a choice I would prefer to learn from a book than from a Web Site	4.2	3	6	19	22	52
F13	I preferred the graphics on the Web Site better than the graphics on the Paper Assisted activity	4.3	0	11	21	21	47
O1	The Web Assisted activity was easier to use than the Paper Assisted activity	3.9	2	10	41	28	18
O2	The Web Assisted activity was more difficult to read than the Paper Assisted activity	3.8	3	11	38	28	19
O3	The Web assisted activity was more difficult to understand than the Paper Assisted activity	3.4	4	8	41	23	21
O4	Web Sites will take over Books in the future	4.0	2	7	20	37	34

| O8 | Student learn more using Web Assisted activities than Paper Assisted activities | 3.7 | 5 | 8 | 42 | 25 | 21 |
| O10 | Finding your way around a Web Site is harder than finding your way around a book | 3.8 | 8 | 8 | 42 | 30 | 19 |

SD- Strongly Disagree; D-Disagree; U-Undecided; A-Agree; SA-Strongly Agree

Differences in attitudes towards OWAL between males and females

Table 9. Chi-Square Analysis of Gender Dependence and OWAL Attitudes (N=46)

	Behavior	Affective	Cognition	CASS
Chi-Square	0.604	0.28	0.006	0.125
Asymptotic Significance	0.487	0.570	0.951	0.691

Table 8 provides a summary of the relationship of gender to OWAL attitudes using Chisquare analysis. It indicates that there is no significant difference ($p<0.05$) in gender, and thebehavior, affective, cognitive and CASS based attitudes. Table 8 showed no significant difference in attitudes towards OWAL for males or females (all students perceived OWAL in a positive attitude).

Result

In this study, we have found a number of outcomes to the research question, What attitudes do Construction Technology program students have about Online Web Assisted Learning (OWAL), as compared to paper assisted learning (PAL). OWAL activities motivates students better than PAL activities. There are no significant differences of students' attitudes between male and female.

Finally, it can be said that some students accept the use of OWAL to supplement their learning. The data indicate that OWAL classroom activities would aid in the learning process of students because students have positive attitudes towards the use of OWAL.

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