Students' Developments at Computer Courses under the Constructivist Approach

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Abstract

Research study examined the differences of students' improvements for computer courses while they have get constructivist based teaching-learning process with measuring their attitudes during the period of beginning of the term and end of the term. Today's learning-teaching process becomes technology based and provides students to catch constructed knowledge with their experiences. This requires mentioning and analyzing the performance of the students towards their courses and giving further information in order to enhance productivity of teaching-learning process. Constructivism creates a light to educational context by presenting a chance to increase the efficient outcomes at educational process. On the other hand, constructivism is a new dimension to provide motivational, multiple perspectives to people with removing from the lacknesses of behaviorism.

Introduction

With the effects of technological improvements and globalizations, life of people and structure of societies have changed by contributing the having own reality perspective. People become to represent their views by shaping their backgrounds and experiences and start to solve their problems especially learning difficulties with the help of technology facilities (Jonassen, et. al, 1999). Globalization opens a way to increase the sharing of knowledge to people for constructing their information, realities. As it is known, technological improvements affected the educational context especially learning process of students and teaching process of teachers for enhancing the mutual understanding and meaningful learning facilities. Technology is used for a tool with its hardware and software sides as a teaching guide of teachers and provides to fulfill the lacknesses. On the other hand, behaviorism worked to satisfy learning of students with its strategies. In addition to this, technology creates a perspective that everyone has own alternative and people are free to behave as they want to do. Because of this reason, behaviorism usefulness becomes ineffective and constructivism becomes a big huge of educational context. This means that rather than focusing to behaviors of students to realize their performances, looking the cognitive functioning becomes vital consideration to create meaningful and stable learning.

Constructivism focuses on developments of meanings, making sense from students' actions, by diverging two sides that are realist and radical. According to realist constructivist, learning can be occurred by constructing internal cognitive structures and they assumed that cognition is a process by which learners construct mental structure to match with external structures. On the other hand, radical constructivist refers that cognition serves to organize the learner's experiential world and learning can occurred with the collaborative work, discussions and social interactions which offer to students for constructing their experiential world (Plomp, et. al., 1996). Basic step is to accomplish constructivist perspective rather than traditional perspective at learning-teaching process to analyze needs and wants of students and objective of the teachers. Providing students to get meaningful understanding with their constructed knowledge, teachers become a facilitative position at their context rather than transmitting knowledge. Establishing mutual understanding between teachers and students about concepts, process, facts that learners must learn provide for getting completion of task with the established transaction among them. Having various tools and materials for students' diversities is necessary to get equality and provide for everyone have meaningful learning by solving problems with research and technology based courses (Duffy, Jonassen, 1992).

Aim of the Research

Computer and computer based courses that are the technology and research functioning with providing discovery to solve problems are the reflections key issue to apply constructivist perspective environment. Because constructivist requires problem solving, experimental understandings through students' own realities and the experiences. Teachers play as a coach role for the students' learning process by the support of technological facilities and interactions. New field of educational technology is constructivism that includes new dimensions about learning philosophy by emphasizing the experiencing phenomena, interpreting those experiences based on what people already know, reasoning about them and reflecting on the experiences in order to occur learning meaningfully. Under the perspective of educational technology main goal is to achieve master learning of students, because of this reason constructivist establish various perspectives to implement mutual and meaningful understanding s for students. On the other hand, they assumed that teaching is not process of imparting knowledge; it is the process of helping learners to construct their own meaning from the experiences as guiding meaning making process (Jonassen, et. al., 1999).

Therefore, knowledge is constructed results from activity, is indexed by the context which learning activity occurs and meaning become in the mind of the knower and is accepted that there multiple perspective on the world when there is an implementation of constructivist philosophy to the teaching-learning process. It is important to notice that not all meaning created equally by students. Meaning making is prompted by a problem, question, confusion, disagreements, sharing with others as a result from conversation.

There is a fundamental difference between constructivist views of learning and traditional view of learning under the principles of knowledge, reality, meaning, symbols, learning and instruction. In addition to this, constructivist view of thinking refers knowledge as a constructed, situated in action or experience, reality as a product of mind, meaning as a reflecting perceptions of experiences, symbols as tools for constructing reality, learning as knowledge construction, interpreting world, and instruction as reflecting multiple perspective. But, traditional view of thinking refers knowledge as transmitted, decontextualized, reality as external to the knower, symbols as representing world, learning as knowledge transmission, well structured, instruction as simplifying knowledge under the abstract rules. In order to engage different kinds of thinking, educators must rethink the ways that they teach   and the ways that they use technology in their teaching process. For getting meaningful learning, using technological facilities get vital role (Jonassen, et. al., 1999).

Under these assumptions, research study was examined the developments of students under the constructivist approach at computer courses by focusing the differences of their performance as comparing during the period of beginning the term and end of term. Questionnaire was designed to analyze attitudes and abilities of students about computer courses in order to realize the effects of constructivist perspective on students' learning.

Importance of the Research

Main goal of the educators to find suitable context to enhance the alternatives that provide meaningful learning for students. By the developments of technology, educational context was affected under the catching of new trends for effective teaching-learning process. While schools play a variety of important social, custodial and organizational roles in communities, their primary obligation is to help students to learn how to recognize and solve problem and comprehend new phenomena, construct mental models of these phenomena under the given situation. Constructivist view of thinking refers knowledge as a constructed, situated in action or experience, reality as a product of mind, meaning as a reflecting perceptions of experiences, symbols as tools for constructing reality, learning as knowledge construction, interpreting world, ill-structured, authentic-experiential, process-oriented and instruction as reflecting multiple perspective in order to create meaningful learning. If the goals of educators whose have technology based activities on their instruction should support meaningful learning by engaging students in active, constructive, intentional, cooperative learning. As mentioning active learning, accepting that learning is a natural and adaptive human process and including human interactions is important (Jonassen, et. al, 1999).

Constructivism gives alight to students for getting their responsibility on learning, being motivated by representing personal understanding. It is curious that constructive process can be facilitated by appropriate learning activities and good learning environment. Constructivism has two principles which are person knows is not passively received, but actively assembled by the learner and learning serves as an adaptive function by operating personal world under these circumstances (Grabe, et. al., 2001).

Building useful personal knowledge as learning definition under the constructivist can be applied by technological elements and today, following this approach is necessary to establish critical and creative thinking for students. First step can be started by implementing computer courses in order to teach students learning by doing and solving their problems. Because of this reason, research study handled the students developments periods by applying constructivist principles to sixty two students at undergraduate position in order to examine their abilities towards computer tools and programs with comparing their abilities under the circumstance of beginning the term and end of the term. Questionnaire evaluated the abilities of students and their personal backgrounds that affect students learning process. Although there are difficulties to apply constructivist view, it is obvious that it provides to increase productivity of teachers and reflective thinking of students as well.

Related Researches

Some related researches based on the use of constructivism for teaching computer courses are as shown below:

İşman (2002) requires roles of teacher and students that are represented and these roles could be applied to the roles of the students and teachers interaction in class education process. Teacher Role in Education based on Constructivist Approach; 1. Teacher should be in consciousness of learner autonomy. Teachers should inform be aware of the individual differences of them, 2. Teacher should use real and current information to transmit

knowledge. In other words, teacher should be well educated and on going researcher in order to reflect information and give concrete update examples and summarizes about subjects for the permanent learning of the students, 3. Teachers should give the importance of thoughts of students. They should posses the research environment to the students in order to search and evaluate their experiences on content under the sense of self-regulation, 4. Teachers should be aware on the individual differences of the students and design course materials based on this consciousness, 5. Teachers should know the students prerequisite skills on the content to build new knowledge construction. In addition to this; teacher should know the how learner can learn based on strategies, 6. Teachers are the main communicators to establish interaction between the teacher and students. Teacher should have technological, communicational skills to implement distance education effectively, 7. Teachers should implement the courses based on the student centered learning process. Students should feel the responsibility of learning and consult to teacher. Therefore; teacher should provide concrete time, place and opportunities of interaction, 8. Teachers should help the self-development and responsibility of the students with their guidance, 9. Teachers should provide the environment of collaborative learning, interactive discussion groups for the easy and permanent learning of students with related materials, 10. Teachers should give the proper feedback to the students and help them to inter relate the subjects. In addition to this; teachers should guide for finding the fields of the students.

Student Role in Education based on Constructivist Approach; 1. Students should be in interaction between teacher in order to get proper feedback on their self-directed subjects and consult to teacher for correctness and evaluation. Students can be in collaborative learning with their class members through the technological support, 2. Students are self-responsible on their learning. They should decide what they want to learn and make individual study on their subject, 3. Students should come to the solutions for problems with data through the research instead of implementing available data. Therefore they should be researcher, 4. Students should be problem solver. They should implement what they learn on problems and set solutions strategies with using relevance information, 5. Students should be well informed from the technology to not face with communicational barriers because of technology. In addition to this; they should use technology to construct the learning with rich materials, 6. Students should be learners through the life. The students should know how to access and use the information whatever the instruction was finished. They should reach the information immediately if it is necessary.

Maddux, et. al. (1997) pointed out that Constructivist approach requires reality is more than the learning environment. The authors indicated that there are important alternatives and advantages of the constructivist approach beside its limitations as well. There is a more focus on the application of the constructivist approach into the classroom environment. In addition to this, technology has a great role to apply constructivist approach to the instructional learning process. What it means that constructivists use the technology in classroom are now are common. One reason is that constructivist applications involve much more than assigning students time at the computer. Constructivist teaching calls for flexibility on-the spot of analysis and decision making, and a comfortable confidence that students can learn and achieve without constant teacher-centered instruction and direction.

Forcier (1996) pointed out that there are developments for the learning process as an approach. And the constructivist perspective is the one of the current approach that most of the educators start to apply it into the education cycle. There is important sense that constructivist approach requires experiencing the reality through the communicational base. Constructivism support that learners must be provided a rich environment of sensory experiences to which they will respond in order to build understandings. The computer, through its use of text, sound, graphics, animation and multimedia control, is ideally suited to present such a rich environment.

Gruba, Søndergaard (2001) pointed out the constructivist approach in computer education. From the social constructivist perspective of education, learning is best achieved when students face complex, real world problems in which there are no clear answers. Faced with a sizable common goal, students work collaboratively towards outcomes and maintain ownership over key decisions. The role of staff is that of facilitators whose role is to challenge learners to explore multiple aspects of the problem as they go about reaching viable solutions. Such a role contrasts, for example, to an approach that sets out to lead students to a presumed correct solution that is already possessed by the instructor. Based on these principles they designed and implemented a course on communication skills in computer science. Here, they describe our experiences using a student-run conference as a means to teach communication skills. In constructivist approach, students were charged with the task of planning and organizing a conference, including peer review, publicity, budget, sponsorship, web design, conference program, presentation schedule, speaker support, and catering. Authors described the principles and their implementation and reflect on the outcome.

Grabe, et. al. (2001) pointed out that Constructivism gives alight to students for getting their responsibility on learning, being motivated by representing personal understanding. Constructive process can be facilitated by appropriate learning activities and good learning environment. Constructivism has two principles which are person

knows is not passively received, but actively assembled by the learner and learning serves as an adaptive function by operating personal world under these circumstances. Constructivist approach effect the every learning of the any courses understanding for students especially the learning behavior of students start to change towards own learning.

Method
Operational Definition of Variables
        This study was designed to examine students' developments in computer courses under the application of constructivist approach, computers and to realize their tendencies based on gender, family financial situation, position of students, education level of their mothers and fathers, having computers at their homes, having internet at their homes and student's daily usage. Independent and dependent variables in this study were as follows.

Independent variables: Students' Characteristics.
    1- Gender.
    2- Family financial situation.
    3- High schools of graduated students.
    4- Having computer in their homes.
    5- Having Internet in their homes.
    6- Daily computer usage.

Dependent variables: Students' attitudes were evaluated by survey.
    1- Windows usage.
    2- Windows settings.
    3- Windows task bar.
    4- Windows program run.
    5- Word file open.
    6- Word file save.
    7- Word picture insert.
    8- Word text insert.
    9- Word text format.
    10- Word page format.
    11- Word using tables.
    12- Word copy & paste.
    13- Word file print.
    14- Word language/ grammar settings.
    15- Power point file open.
    16- Power point file save.
    17- Power point picture insert.
    18- Power point text insert.
    19- Power point slide format.
    20- Power point text format.
    21- Power point using tables.
    22- Power point slide show & settings.
    23- Power point using effects.
    24- Power point file print.
    25- Power point using templates.
    26- Power point using tools.
    27- E-mail send in internet.
    28- E-mail receives in internet.
    29- E-mail account open in internet.
    30- Using search engines in internet.
    31- Information search in internet.
    32- File download in internet.
    33- File upload in internet.
    34- Chat in internet.

Identification of the Population
 The population under investigation included undergraduate students taking courses during Fall 2002-2003 school year in Eastern Mediterranean University at Northern Cyprus.

Sample
 Sample selected by the method of random sampling as sixty-two undergraduate students taking "Introduction to Computers" course (COMP 191) offered in Fall 2002-2003 school term in Eastern Mediterranean University.

Instrument
 For this research study, questionnaire was designed for analyzing students' developments at computers courses with the application of constructivist approach by comparing their reflections during the periods beginning of the term and end of the term. There were 40 items at this instrument (6 independent variables related with personal information, and 34 dependent variables related with Windows, Word, PowerPoint, and Internet).

Data Collection
 Undergraduate students' developments at computer courses with the application of constructivist approach were analyzed through the prepared questionnaire. Students' responses to the questionnaire were statistically analyzed according to gender, family financial situation, high school graduated of students, having computers at their homes, having internet at their homes and student's daily usage by realizing the differences of their reflections between the beginning the term and end of the term.

Data Analysis Procedures
 In this study, quantitative research methods were used in order to investigate the research problem that is students' developments at computers courses with the application of constructivist approach. Questionnaire as survey was designed to get the reflections of students towards computer courses developments under the application of constructivist approach.

Data Analysis and Presentation of Findings
 The main purpose of this study was to students' developments at computers courses with the application of constructivist approach with the definitions of gender, family financial situation, High school graduated of students, having computers at their homes, having internet at their homes and student's daily usage by the support of statistical analysis and evaluation that questionnaire results are the basis of these evaluations.
The light of quantitative data analysis examines demographic data and frequencies for all items in the survey.

Demographic Data
 The first six items of survey asked for "Personal Data", including the variable of gender (Table 1), family financial situation (Table 2), having computers at their homes (Table 3), having internet at their homes (Table 4), type of graduated schools of students (Table 5), and student's daily usage of computers (Table 6) are shown in the following:

Table 1: **Gender**

Gender	Responses	Percentage
Male	18	29 %
Female	44	71 %

Table 2: **Family financial situation**

Family financial situation	Responses	Percentage
Less than 250 Million TL	1	1.6 %
Between 250 & 500 Million TL	9	14.5 %
Between 500 & 750 Million TL	18	29 %
Over 750 Million TL	34	54.8 %

Table 3: **Do you have computer at home?**

Do you have computer at home?	Responses	Percentage
Yes	49	79 %
No	13	21 %

Table 4: **Internet connection at home?**

Internet connection at home?	Responses	Percentage
Yes	34	54.8 %
No	28	45.2 %

Table 5: **High school type**

High school type	Responses	Percentage
Vocational	9	14.5 %
Secondary high school	21	33.9 %
Teacher training high school	2	3.2 %
Other	30	48.4 %

Table 6: **Daily computer use**

Daily computer use	Responses	Percentage
Less than 1 hour	20	32.3 %
Between 1 & 2 hours	27	43.5 %
Between 2 & 3 hours	10	16.1 %
Over 3 hours	5	8.1 %

An analysis of the characteristics of the target population for the study, indicated that 29% of the respondents were male and 71% of were female. Similarly, 1.6% was family financial income less than 250 million TL (Turkish Lira), 14.5% were between 250 and 500 million TL, 29% were between 500 and 750 million TL, and 54.8% were over 750 million TL. About 79% of the respondents have a computer and 21% of them don't have a computer at home. Similarly, 54.8% of the respondents have an Internet connection at home and 45.2% do not have Internet connection at home. About 14.5% of the respondents graduated from vocational high school, 33.9% of them graduated from secondary high school, 3.2% graduated from teacher training high school, and 48.4% graduated from other types of high schools. Similarly, 32.3% of the respondents use computer less than 1 hour daily, 43.5% of them use computer between 1 and 2 hours, 16.1% use a computer between 2 and 3 hours, and the rest 8.1% use a computer over 3 hours daily.

It is important to mention that demographic data do not reflect the different frequencies between the before and after the application of the constructivist view on computer courses for the selected sample. But the following steps of statistical evaluations can vary according to before and after applications of concept.

On the other hand, in order to examine the differences of students' developments, we should compare the previous (frequencies of Individual Items for non application of constructivist view (Pre-test)) and after (frequencies of Individual Items for the application of constructivist view (post-test)) implementation of constructivist approach to get accurate results.

Frequency of Individual Items (Pre-test & Post-test)
        As it is realized, there are great differences between pre-test and post-test frequency distributions (Table 7).

Table 7: **Pre-test and Post-test frequency distributions**

| | Comparison Frequency Percentage Distribution (Pre-test and Post-test) | | | | | | | | | | | |
| | No idea | | | No experience | | | Little experience | | | Enough experience | | |
Questions	Pre	Post	Diff.	Pre	Post	Diff.	Pre	Post	Diff.	Pre	Post	Diff.
Windows Related												
Usage.	30.6	19.4	**-11.2**	8.1	6.5	**-1.6**	27.4	33.5	**6.1**	33.9	40.3	**6.4**
Settings.	32.3	21	**-11.3**	4.8	9.7	**4.9**	35.5	40.3	**4.8**	27.4	29	**1.6**
Task bar.	40.3	21	**-19.3**	12.9	14.5	**1.6**	19.4	32.5	**13.1**	27.4	32.5	**5.1**
Program run.	32.3	19.4	**-12.9**	11.3	16.1	**4.8**	29	29	**0**	27.4	35.5	**8.1**
Word Related												
File open.	14.5	8.1	**-6.4**	30.6	4.8	**-25.8**	0	17.7	**17.7**	54.8	69.4	**14.6**
File save.	17.7	8.1	**-9.6**	1.6	3.2	**1.6**	27.4	19.4	**-8**	53.2	69.4	**16.2**
Picture insert.	24.2	9.7	**-14.5**	6.9	4.8	**-2.1**	29	19.4	**-9.6**	40.3	66.1	**25.8**
Text insert.	29	9.7	**-19.3**	16.1	6.5	**-9.6**	25.8	24.2	**-1.6**	29	59.7	**30.7**
Text format.	32.3	12.9	**-19.4**	12.9	8.1	**-4.8**	25.8	29	**3.2**	29	50	**21**
Page format.	29	9.7	**-19.3**	12.9	8.1	**-4.8**	27.4	33.9	**6.5**	29	48.4	**19.4**
Using tables.	30.6	11.3	**-19.3**	4.8	4.8	**0**	30.6	27.4	**-3.2**	33.9	59.7	**25.8**
Copy & paste.	25.8	12.9	**-12.9**	8.1	4.8	**-3.3**	22.6	22.6	**0**	43.5	59.7	**16.2**
File print.	21	14.5	**-6.5**	6.5	3.2	**-3.3**	19.4	21	**1.6**	53.2	61.3	**8.1**
Language/ grammar.	22.6	14.5	**-8.1**	6.5	6.5	**0**	32.3	24.2	**-8.1**	38.7	54.8	**16.1**
PowerPoint Related												
File open.	22.6	9.7	**-12.9**	3.2	4.8	**1.6**	22.6	17.7	**-4.9**	51.6	67.7	**16.1**
File save.	24.2	9.7	**-14.5**	16.1	3.2	**-12.9**	24.2	21	**-3.2**	50	66.1	**16.1**
Picture insert.	25.8	11.3	**-14.5**	8.1	4.8	**-3.3**	22.6	21	**-1.6**	43.5	62.9	**19.4**
Text insert.	33.9	11.3	**-22.6**	9.7	4.8	**-4.9**	25.8	29	**3.2**	30.6	54.8	**24.2**
Slide format.	40.3	11.3	**-29**	12.9	12.9	**0**	21	29	**8**	25.8	46.8	**21**
Text format.	38.7	11.3	**-27.4**	14.5	8.1	**-6.4**	22.6	30.6	**8**	24.2	50	**25.8**
Using tables.	38.7	9.7	**-29**	6.5	6.5	**0**	27.4	32.3	**4.9**	27.4	51.6	**24.2**
Slide show settings.	35.5	9.7	**-25.8**	11.3	6.5	**-4.8**	25.8	32.3	**6.5**	27.4	51.6	**24.2**
Using effects.	38.7	11.3	**-27.4**	8.1	14.5	**6.4**	24.2	24.2	**0**	27.4	50	**22.6**
File print.	32.3	11.3	**-21**	6.5	3.2	**-3.3**	19.4	30.6	**11.2**	41.9	54.8	**12.9**
Using templates.	41.9	12.9	**-29**	9.7	11.3	**1.6**	24.2	29	**4.8**	24.2	46.8	**22.6**
Using tools.	37.1	11.3	**-25.8**	8.1	6.5	**-1.6**	22.6	32.3	**9.7**	32.3	50	**17.7**
Internet Related												
E-mail send.	11.3	6.5	**-4.8**	12.9	11.3	**-1.6**	16.1	12.9	**-3.2**	59.7	69.4	**9.7**
E-mail receive.	12.9	8.1	**-4.8**	16.1	9.7	**-6.4**	14.5	14.5	**0**	56.5	67.7	**11.2**
E-mail account open.	19.4	14.5	**-4.9**	12.9	9.7	**-3.2**	16.1	16.1	**0**	51.6	59.7	**8.1**
Using search engines.	32.3	17.7	**-14.6**	9.7	14.5	**4.8**	14.5	17.7	**3.2**	43.5	50	**6.5**
Information search.	22.6	8.1	**-14.5**	9.7	17.7	**8**	21	19.4	**-1.6**	46.8	54.8	**8**
File download.	33.9	16.1	**-17.8**	14.5	16.1	**1.6**	16.1	21.1	**5**	35.5	46.8	**11.5**
File upload.	33.9	19.4	**-14.5**	14.5	17.7	**3.2**	17.7	24.2	**6.5**	33.9	38.7	**4.8**
Chat.	14.5	11.3	**-3.2**	1.6	4.8	**3.2**	22.4	22.6	**0.2**	61.3	61.3	**0**

Therefore, frequencies that represent with the application of constructivist view at computer courses more responds to "having little experiences and enough experiences". This shows that constructivist approach has effect on students' learning process making them to search and solve their problem by merging their experiential fields.

Research model is a design of research and gives direction to all activities. At this research, in order to create varieties of data about computer, constructivist approach and to realize its effectiveness, and evaluating world standards about the application and effectiveness of the constructivist approach on students learning, descriptive research method model is used. In addition to this, research will be analyzed that how constructivist approach directly effect the learning of students as fast, permanent base of knowledge as being new teaching and learning method rather than classical teaching and learning methods through learning the perceptions and situations of students with applying questionnaire. At the basis of sample of the research, this model will be implemented to sixty two students in Famagusta. In the statistical evaluation of the data, t-test and one-way ANOVA were used to clarify developments of students on computer courses through the constructivist approach.

t-test of Individual Items

Table 8: t-test Independent Samples Test

	t-test for Equality of Means - Sig. (2-tailed)					
	Gender		Computer at home?		Internet connection at home?	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Windows related						
Usage.	.420	.215	**.003**	**.005**	**.001**	**.008**
Settings.	.429	.152	**.026**	**.041**	**.004**	**.035**
Task bar.	.499	.410	.186	**.031**	**.003**	**.004**
Program run.	.326	.750	**.024**	**.034**	**.002**	**.006**
Word related						
File open.	.481	.724	**.000**	**.040**	**.022**	.052
File save.	.472	.650	**.004**	**.028**	.051	.066
Picture insert.	.310	.403	**.007**	**.028**	.141	**.017**
Text insert.	.507	.496	.111	.080	.177	**.025**
Text format.	.948	.287	.087	.114	.121	**.027**
Page format.	.860	.780	**.027**	.166	.052	**.011**
Using tables.	.624	.215	.086	.144	.153	.075
Copy & paste.	.255	.359	.083	**.027**	.051	.051
File print.	.262	.096	**.002**	**.031**	**.002**	.099
Language/grammar settings.	.872	.238	**.011**	.053	**.039**	.060
PowerPoint related						
File open.	.556	.720	**.006**	.164	.097	.088
File save.	.652	.515	**.004**	.086	**.037**	.083
Picture insert.	.361	.459	**.024**	**.040**	.264	**.043**
Text insert.	.215	.378	.223	.050	.430	**.029**
Slide format.	.286	.761	.124	.172	.309	**.008**
Text format.	.276	.468	.115	.128	.298	**.022**
Using tables.	.534	.588	.253	.444	.523	.112
Slide show & settings.	.249	.408	.222	.177	.342	**.033**
Using effects.	.203	.368	.258	.050	.527	**.014**
Files print.	.425	.208	**.049**	.076	.054	.070
Using templates.	.316	.462	.324	.210	.602	.052
Using tools.	.830	.996	.186	.292	.238	.097
Internet related						
E-mail send.	.927	**.024**	**.035**	.970	**.002**	.788
E-mail receive.	.689	**.022**	.100	.658	**.002**	.604
E-mail account open.	.818	**.026**	.303	.349	**.005**	.311
Using search engines.	.752	.244	.349	.095	.069	**.016**
Information search.	.918	.281	.075	.447	**.001**	.059
File download.	.928	.376	.055	**.016**	**.001**	**.033**
File upload.	.878	.272	.059	**.008**	**.001**	**.010**
Chat.	**.047**	.078	**.003**	.565	**.020**	.709

Pre-test - According to Independent Samples Test results at table 8 that were done for gender; as indicated above, all values are higher than the standard value that is 0.05. This result indicates that there is no meaningful difference between genders based on these questions responds, except Internet related chat (0.047).

According to Independent Samples Test results at table 8 that were done for having computer at home as indicated above, some of the values are higher than the standard value that is 0.05. This result indicates that there is no meaningful difference between having computer at home and statements based on these questions responds. But the statements of Windows usage (0.003), Windows settings (0.026), Windows program run (0.024), Word file open (0.000), Word file save (0.004), Word picture insert (0.007), Word page format (0.027), Word file print (0.002), Word language/grammar settings (0.011), PowerPoint file open (0.006), PowerPoint file save (0.004), PowerPoint picture insert (0.024), PowerPoint file print (0.049), Internet e-mail send (0.035), internet chat (0.003) which are lower values than ($\alpha = 0.005$) standard value by indicating meaningful difference between the statements and computer at home as a dependent variable.

According to Independent Samples Test results at table 8 that were done for having the internet connection at home; as indicated above, some of the values are higher than the standard value that is 0.05. This result indicates that there is no meaningful difference between having internet connection and statements based on these questions responds. But the statements of Windows usage (0.001), Windows settings (0.004), Windows taskbar (0.003), Windows program run (0.002), Word file open (0.022), Word file print (0.002), Word language/grammar settings (0.039), PowerPoint file save (0.037), Internet e-mail send (0.002), Internet e-mail receive (0.002), internet e-mail account open (0.005), Internet information search (0.001), Internet file download (0.001), Internet file upload (0.001), internet chat (0.020) which are lower values than (α = 0.005) standard value by indicating meaningful difference between the statements and Internet connection at home as a dependent variable.

Post-test - According to Independent Samples Test results at table 8 that were done for gender; as indicated above, all values are higher than the standard value that is 0.05, except the statements related with Internet related e-mail send (0.024), e-mail receive (0.022), e-mail account open (0.026). These results indicate that there is meaningful difference between genders based on these questions responds under the application of constructivist view.

According to Independent Samples Test results at table 8 that were done for having computer at home as indicated above, some of the values are higher than the standard value that is 0.05. This result indicates that there is no meaningful difference between having computer at home and statements based on these questions responds. But the statements of Windows usage (0.005), Windows settings (0.041), Windows taskbar (0.031), Windows program run (0.034), Word file open (0.040), Word file save (0.028), Word picture insert (0.028), Word copy and paste (0.027), Word file print (0.031), PowerPoint picture insert (0.040), Internet file download (0.016), and internet file upload (0.008) having the values which are lower than standard value by indicating meaningful differences between the statements and computer at home as a dependent variable.

According to Independent Samples Test results at table 8 that were done for having the internet connection at home; as indicated above, some of the values are higher than the standard value that is 0.05. This result indicates that there is no meaningful difference between having internet connection and statements based on these questions responds. But the statements of Windows usage (0.008), Windows settings (0.035), Windows taskbar (0.004), Windows program run (0.006), Word picture insert (0.017), Word text insert (0.025), Word text format (0.027), Word page format (0.011), PowerPoint picture insert (0.043), PowerPoint text insert (0.029), PowerPoint slide format (0.008), Power Point text format (0.022), PowerPoint slide show and settings (0.033), PowerPoint using effects (0.014), Internet using search engines (0.016),Internet file download (0.033), and internet file upload (0.010) having the values which are lower than standard value by indicating meaningful differences between the statements and Internet connection at home as a dependent variable.

ANOVA of Individual Items (Pre-test & Post-test)

Pre-test - According to ANOVA results at table 9 that were done for family financial income; as indicated above, all values are higher than the standard value that is 0.05. This result indicates that there is no meaningful difference between the family incomes based on these questions responds, except Internet related chat (0.008).

Table 9: ANOVA analysis

	Sig. (2-tailed)					
	Financial income of students' family		**Type of the school the students graduated from**		**Students daily use of computer**	
	Pre-test	**Post-test**	**Pre-test**	**Post-test**	**Pre-test**	**Post-test**
Windows related						
Usage.	.059	.118	.069	.241	.058	.080
Settings.	.107	.365	**.029**	.201	**.004**	.138
Task bar.	.158	**.028**	**.001**	.061	**.002**	.093
Program run.	.083	.053	**.012**	.163	**.007**	.052
Word related						
File open.	.062	.250	.066	**.043**	.076	.249
File save.	.145	.213	**.005**	.037	.148	.287
Picture insert.	.132	.188	**.047**	.078	.124	.281
Text insert.	.319	.292	**.003**	.075	**.017**	.470
Text format.	.545	.439	**.013**	.185	**.013**	.260
Page format.	.169	.490	**.012**	**.049**	**.007**	.352
Using tables.	.452	.323	**.044**	**.040**	.062	.388
Copy & paste.	.241	.252	**.023**	.176	.127	.274
File print.	.069	.304	**.015**	.188	**.029**	.263

Language/grammar settings.	.529	.432	**.027**	.158	**.014**	.229
Power Point related						
File open.	.652	.182	.312	.080	.061	.514
File save.	.532	.168	.220	.072	.133	.497
Picture insert.	.619	.318	.123	.127	.322	.361
Text insert.	.198	.667	.163	.114	.062	.690
Slide format.	.287	.424	.178	.163	.113	.343
Text format.	.170	.597	.249	.112	.322	.442
Using tables.	.754	.305	.064	.091	.076	.732
Slide show & settings.	.293	.192	.052	.126	.200	.371
Using effects.	.407	.458	.060	.190	.060	.596
Files print.	.516	.231	.109	.111	.149	.517
Using templates.	.116	.573	.106	.161	**.009**	.614
Using tools.	.682	.209	.126	**.041**	.055	.690
Internet related						
E-mail send.	.079	**.012**	.078	**.034**	**.014**	.785
E-mail receive.	.060	**.002**	**.038**	**.021**	**.041**	.700
E-mail account open.	.294	**.034**	.063	.172	**.005**	.586
Using search engines.	.539	**.008**	.184	.113	**.013**	.347
Information search.	.468	**.007**	.135	.063	.058	.388
File download.	.292	**.009**	**.015**	.173	**.002**	.087
File upload.	.477	**.016**	**.012**	.241	**.004**	.057
Chat.	**.008**	.066	**.037**	**.047**	.206	.662

According to ANOVA results at table 9 that were done for having high school type as indicated above, some of the values are higher than the standard value that is 0.05. This result indicates that there is no meaningful difference between high school type and statements based on these questions responds. But the statements of Windows settings (0.029), Windows taskbar (0.001), Windows program run (0.012), Word file save (0.005), Word picture insert (0.047), Word text insert (0.003), Word text format (0.013), Word page format (0.012), Word using tables (0.044), Word copy and paste (0.023), Word file print (0.015), Word language/grammar settings (0.027), Internet e-mail receive (0.038), Internet file download (0.015), Internet file upload (0.012), and internet chat (0.037) which are lower values than ($\alpha = 0.005$) standard value by indicating meaningful difference between the statements and the high school type as a dependent variable.

According to Independent Samples Test results at table 9 that were done for daily use of computers; as indicated above, some of the values are higher than the standard value that is 0.05. This result indicates that there is no meaningful difference between daily use of computers and statements based on these questions responds. But the statements of Windows settings (0.004), Windows taskbar (0.002), Windows program run (0.007), Word text insert (0.017), Word text format (0.013), Word page format (0.007), Word file print (0.029), Word language/grammar settings (0.014), PowerPoint using templates (0.009), Internet e-mail send (0.014), Internet e-mail receive (0.041), internet e-mail account open (0.005), Internet information search (0.013), Internet file download (0.002), and Internet file upload (0.004) which are lower values than ($\alpha = 0.005$) standard value by indicating meaningful difference between the statements and daily use of computers as a dependent variable.

Post-test - According to ANOVA results at table 9 that were done for family financial income; as indicated above, all values are higher than the standard value that is 0.05. This result indicates that there is no meaningful difference between the family incomes based on these questions responds, except Windows taskbar (0.028), Internet e-mail send (0.012), Internet e-mail receive (0.002), Internet e-mail account open (0.034), Internet using search engines (0.008), Internet information search (0.007), Internet file download (0.009), Internet file upload (0.016).

According to ANOVA results at table 9 that were done for having high school type as indicated above, some of the values are higher than the standard value that is 0.05. This result indicates that there is no meaningful difference between high school type and statements based on these questions responds. But the statements of Word file open (0.043), Word page format (0.049), Word using tables (0.040), PowerPoint using tools (0.041), Internet e-mail send (0.034), Internet e-mail receive (0.021), and internet chat (0.041) which are lower values than ($\alpha = 0.005$) standard value by indicating meaningful difference between the statements and the high school type as a dependent variable. According to Independent Samples Test results at table 9 that were done for daily use of computers; as indicated above, some of the values are higher than the standard value that is 0.05. This result indicates that there is no meaningful difference between daily use of computers and statements based on these questions responds.

When it is examined the results of research and questionnaire, students have positive tendency and developments on their learning through the constructivist approach implications on learning. This means that there should be application of new trends on learning, educators and students should catch the useful applications of consciousness and importance about constructivist approach. In addition to this, there should be tendency to apply the consciousness or willingness of new technological style because education needs new trends, application, encouragement and facilitative environment instead of following traditional style of learning-teaching process. Because students need meaningful learning, on the other hand teachers need to establish productive duties.

Comments and Recommendations

Computer application and technology based education through constructivist approach is a new trend that has wide range of affections on all areas. It has an effect on education by influencing the students learning as a being technological and cultural functions. By Constructivist approach and technological trends like computer, students can catch stable, contemporary knowledge with its multi functional tools. While thinking contemporary educational context, dealing with application of knowledge, research for learning become vital part on students and educators environment. Because of this reason, the aim of this study was defined as to make awareness of new trends about constructivist approach and its effects and application results in computer lesson through examining the developments of students. On the other hand, Constructivist Approach has a facility to improve creative and critical thinking of students by providing research facilities. The importance of the study is to emphasis that Constructivist Approach has an impact on students' learning by providing stable and active learning with its applicable property about students' knowledge. Constructivist Approach is key issue that is providing people a sense of equality, self-responsibility and self-decisions choices and experience of reality with stable learning. People become active role while they are learning and they also need guidance to shape them in a correct way. Teachers are the main observer to realize the learning of students. Moreover, students can have a chance to compare what they learn at class in order to catch real knowledge of themselves. There are assumptions; Constructivist Approach requires new dimension of permanent learning, it is the new technological development that provides communication health instantly and it has global effect, culture formation function on learning.

When the reflected results are compared as before applying constructivist view and after applying constructivist view, there are changes as the developments of students. Students' responds increase to the options "have little and enough experience" and they started to engage with the options of Windows, Word, PowerPoint, and Internet. These results indicate that all applications of constructivist view makes students to be more interested in searching and learn meaningfully by knowing various tools at computer courses. Therefore, students' learning enhanced with the applications of constructivist approach at their computer courses.

As it is realized that most of students believe that constructivist approach has effective and useful facilities at competitive environment and they are consciousness about its facilities, trends, impact of positive tendency for their learning. In addition to this, they support that students need new application of constructive perspective in computer courses to get efficient searching environment in order to get related knowledge. At these conclusions, by following new trends and considering learning needs of students in order to create critical and creative thinking, requires the need of Constructivist Approach. Because of these reasons, people should accept that Constructivist Approach has great influencer on educational context with its advantages that are providing stable, fast learning and equal standards, experiencing of reality for students' learning. The responsibility of educators is to realize the basic advantage of Constructivist Approach and choose as a proper way to apply it at their teaching activities. Furthermore, implementing constructivist view at schools is unattained issue in order to realize the positive effects on learning. Creating consciousness and applications of constructivist view on computer courses will reflect the main difference and positive advantages on learning of students.

As a result, Constructivist Approach can be worked better as a being great influencer on learning and providing stable learning if students have a chance to live and experience it in their courses especially computer courses at their education life.

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