THR EFFECTIVENESS OF INTERACTIVE INSTRUCTION CD DESIGNED THROUGH THE PRE-SCHOOL STUDENTS

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ABSTRACT

The current study focuses on the effectiveness of interactive instruction CDs which was designed for pre-school students. Sixty-seven second grade student who were taking "Computer Teaching in Pre-School Education" at Anadolu University, Education Faculty, Department of Pre-school Education participate in the current study. The data were collected in the fall semester of 2006. The data collection procedure lasted for 14 weeks. "Computer Aided Instructiona Tool Evaluation Scale" was developed to analyze the current data. The aim of the scale instrument is to determine the effectiveness of interactive instructio CDs designed for the pre-school students. Descriptive survey was used to examine the resulting opinion of the students. For the research question, Arithmeti Mean (X), Frequency (f) and percentage (%) scores was used.

Keywords: Interactive Computer aided instruction, computer use in pre-school, interactive instructional CD.

INTRODUCTION

The opportunuties of the century changed through new technological approaches in every field. One and the most important of these fields is education and instructional systems. Through the technological changes students of this century need to understand the opportunities and advantages of the new approaches. The effective use of technological opportunuties by students and teachers on education is the requirement of new technological world.

Barr (1990) emphisizes "If we wish to prepare students for life-long learning, we must begin to introduce them to the tools which they will use in the careers they pursue after their formal education is completed".

Technological advances with multimedia changes the way of information, sources of information and the communication. The pace of changes in technology also changes educational approaches and offers new opportunities to the instructional systems. Technological approaches which includes multimedia application and contains text, graphics, and all other media has become increasingly important for students in schools. Because the use of the multimedia opportunuties make the instruction readily available, more affordable, limitless accessible, easily comprehensible. The role of technology in every step of the instructional systems is the requirement of today's world.
Technology aided instructional applications in schools have become widespread, from pre-schools through the university level. Instructional technology use in pre-schools help students learn effectively and increase learning enjoyment through game-based instruction.

The technology is a place where children can have fun while exploring the many exciting things through its opportunuties. Technology is also a way for children to demonstrate self-direction and independence. If technology can be used effectively in classrooms, children's learning opportunuties will multiply. Successfull experiences with technology depends on how the technology is integrated into the classroom (Dodge, D., L Colker, & C. Heroman 2002).

The researches below support the effectiveness and requirement of using multimedia opportunuties for instructional systems in pre-schools and early childhood: Clements (1999) maintains that "Technology can change the way children think, what they learn, and how they interact with peers and adults" (Clements, 1999). He also recommends technology as a tool for improving children's learning through exploration, creative problem solving, and self-guided instruction (Clements & Samara, 2003). Haugland (2000) supports teacher implementation of technology in classrooms with children 3 and 4 years old if they are allowed plenty of time to experiment and explore. In a study conducted in 2001, University of South Carolina researchers reported that learning computer skills gives preschoolers who might not excel socially or academically a chance to be good at something else their peers respect. That study also showed how computer use can encourage cooperation and collaboration among preschoolers. (Freeman, N., & Somerindyke, J. 2001).

Cordes and Miller (2000) report that an international group of physicians, scientists, and researchers called for a moratorium on computers in preschools and early elementary grades. They believe that computers interfere with healthy physical and mental development.

McKinnon, Nolan & Sinclair (1996) in their study concluded that " sustained computer use enables students to become not just technolojigally literate but it also enabled them to become producens of knowledge as they analyzed data and information and developed propositions"

Effectively use of technology for instructional systems requires successful adoption of technology opportunuties to the instructional programms. Integrating multimedia opportunuties consist of hardware and software proficiency, instructional

proficiency, detailed design proficiency. Slowinski (2000) suggested that full integration of a technology plan within a school should "be advantageous to teachers, be compatible with needs and expectations, be simple to use, be easily tried without a huge commitment to change, and be observable and modeled by staff who embrace technology".

Jonassen, emphasizes (1985) "rather than creating problems to which we apply our most popular interactive technology, we need to develop design processes which identify the required components of interactive, adaptive instruction" It means the main purpose of creating interactive instructions and the components of interactivity must be carefully examined and defined. Also, Milheim (1996) and Weller (1988) define interactivity having components of quantity and quality of interactions. Quantity refers to the number of interactions and quality refers to the learner being able to control more of the interactions within the lesson. According to Bork (1992) degree and quality of interaction are aspects of interaction that should be considered because they have a promise of being represented quantitatively. The degree of interaction also can be defined as the number of interactions that occur and compared to the total learning process.

Learners must be able to easily focus on learning materials without having to make an effort to figure out how to access them (Lohr, 2000). An effective user interface can fulfill that requirement.

Moore and Clark (1983) argued that most reported academic gains were directly attributable to the increased attention imparted to the instructional design when new technology were considered and adopted for educational purposes.

Interactivity (teacher-learner, learner-learner, and learner-content); student centred control of pertinent information; mechanisms for the learner to discuss the ongoing shaping of their knowledge (Wells, 2001).

Clements & Samara (2002) reported a design process for adopting technological approaches to the instructional systems with the following steps:

- drafting curriculum goals
- building an explicit model of children's knowledge and learning in the goal domain
- creating an initial design
- investigating components of the software design
- assessing prototypes and curriculum (with one-on-one interviews with students and teachers)
- conducting pilot tests (in a few classrooms)
- conducting field tests in numerous classrooms
- publishing the materials

The principles of instruction, the student features and expectations need to be determined to evaluate and choose appropriate technological application through the followings steps above. So the children using the technological application could easily identify opportunities, solve problems and develop appropriate adaptations to technology.

The opportunuties with multimedia technologies for children includes sounds, pictures, photograps, animations, graphics and other devices. All these devices gain children's attention. Developmentally appropriate software engages children in creative play, mastery learning, problem solving, and conversation. The children control the pacing and the action. They can repeat a process or activity as often as they like and experiment with variations. They can collaborate in making decisions and share their discoveries and creations (Haugland & Shade 1990).

Well-designed or carefully choosed early childhood technological tool (instructional CD, games, web pages and etc.) enable children to use technology effectively. Like all educational materials, software should reflect the world children live in. (Haugland & Shade 1994).

Fischer and Gillespie (2003) describe their research in a Head Start classroom. Their findings suggest that (1) open-ended software programs encourage children to explore and extend beyond their thinking, (2) computers are just another option in the classroom, (3) computers help bridge concrete and abstract thinking, and (4) technology stimulates cooperative behaviors among children. They also report that the teacher encourages children to help others who may be struggling with computer use.

Technology use in instructional systems refers to much more applications. It should include interactive learning environments, web based instructional environments, computer aided instructions, e-mail groups, video conference systems and also the technological tools; digital cameras, handheld computers, and other devices.

One of the effective applications of technology aided instruction is interactive instructional CDs. Interactive instructional CDs are effective designs which include texts, sounds, pictures, photographs, illustrations, animations, videos and other multimedia modes. Interactive instructional CD design is constructed on the principle of user-centered instruction. This principle requires interactive instructional CDs to provide students with individual excitement along with triggering their sensation and perception. Through this excitement, interactive instructional CDs provide a well-qualified instruction as well. If these tools are prepared with these instructional purposes in mind, interactive instructional CDs encourage studens to learn more effectively.

Aim Of The Research

In this paper, an approach was proposed to introduce the effectiveness of interactive instructional CDs which was designed for pre-school students.

The research question is what are the criteria of selecting an effective interactive instructional CDs at pre-school level?

The research question was expanded by the questions below:

- What are the students' opinions regarding the content features of the selected instructional CDs for pre-schools for the research?
- What are the students' opinions regarding the the visual, audio and audio-visual features of the selected instructional CDs for pre-schools for the research?

METHOD OF THE RESEARCH

The purpose of this research study was to determine the effectiveness of interactive instruction CD as an instructional tool designed through the pre-school students. Sixty-seven second grade students who were taking "Computer Teaching in Pre-School Education" at Anadolu University, Education Faculty, Department of Pre-school Education participated in the current study. The data were collected in the fall semester of 2006. The data collection procedure lasted for 14 weeks.

"Computer Aided Instructional Tool Evaluation Scale" was developed to analyze the current data. The aim of the scale instrument is to determine the effectiveness of interactive instruction CDs designed for the pre-school students.

The reliability study of "Computer Aided Instructional Tool Evaluation Scale" was made with thirty-five students second grade students who were taking "Computer Teaching in Pre-School Education" at Anadolu University, Porsuk Vocational School, Department of Child Development.

Internal consistency coefficient of Cronbach Alpha for the Reliability of "Computer Aided Instructional Tool Evaluation Scale" was .92. "Computer Aided Instructional Tool Evaluation Scale" was also checked for validity by expert views.

At the first part of the research all participants attended to the "The Education of Interactive Instuction Tool Evaluation" lecture for six weeks (18 hours). The participants, examined and evaluated eight (8) different instructional CDs which was designed for pre-school students through the lecture.

At the second part of the research, 20 instructional CDS which was sold (book stores, internet media and etc.) was determined (20 different CDs' except the CDs used for "The Education of Interactive Instuction Tool Evaluation" lecture). The 20 interactive instructional CDs were determined for the purpose of evaluation over attainable Turkey Scale. Descriptive survey was used to examine the resulting opinion of the students. For the research question, Arithmetic Mean (X), Frequency (f) and percentage (%) scores was be used.

Table 1: Research Sample

Research Sample (Number)	**Attandence to the Research (Number)**
67	67

Table 2: Attributes of the Research Sample

Attribute	**Number**	**Percentage**
Gender		
Female (Anadolu University Education Faculty, Department of Pre-school Education)	66	%98.5
Male (Anadolu University Education Faculty, Department of Pre-school Education)	1	%1.5

FINDINGS AND DISCUSSION

"Compuer Aided Instructional Tool Evaluation Scale" which was developed to analyze the effectiveness of interactive instruction CDs as an instructional tool designed through the pre-school students consist of four different subscales determined as "Content Features, Visual Features, Audio Features, Audio-Visual Features' and 26 items of items of these subscales. The sample scale instrument includes 4-point Likert scale type questions responses that are scored from 1 to 4 and correspond to "1=disagree", "2= neither agree nor disagree", "3=agree", "4=strongly agree".

Items which arithmetic means' is over $\bar{x} \geq 3$ are sufficient feature of interactive instruction CDs which was designed for

pre-school students. Items which arithmetic means' is under $\bar{x} \geqslant 3$ are insufficient feature of interactive instruction CDs which was designed for pre-school students.

The Kolmogorov-Smirnov test (KS-test) was used to determine the distribution is normal or not. The distribution is at left hand side of the scale. Calgulated low standart deviation score reflects that there is no significant diffrence between participants' opinion.

Table 3: Content Features (N=67)

Survey Items	Arithmetic Mean	Standart Deviation
1. Content is age-appropriate	2,2317	,68051
2. Content is clear and simple	2,2154	,67526
3. Content offers practice applications (abstract presentation, exercise, instructional games and etc.)	2,2029	,74598
4. Content offers meaningfull animations, sounds, audio video and etc.	2,1010	,77023
5. Content is accessible to all children (level of difficulty and use of directions etc.)	2,1433	,67945
6. The features of use is appropriate for child (easily use, screen size, buttons size, clear media images)	2,1721	,64496
7. Child can use independently and without adult asistance	2,0990	,68449
8. Child can set the pace of movement through leaving the content and exit at any time	2,3750	,68656
9. Content offers choices that child can control (background choice, music choice, picture choice, character choice and etc.)	2,2260	,65216
10.Content engages childeren to exploration, thinking and problem-solving activities	2,0240	,69813
11.Child or teacher can set the level of difficulty	1,9933	,90499
12.Feedback is meaningful for the children (graphic, sounds and etc.)	1,9413	,76335
Total items score	25,7250	5,31087

The table 3 reflects the findings of "Content Features" of interactive instruction CDs which was designed for pre-school students, present total arithmetic mean as $\Sigma\ \bar{x}$ = 25,72 and total standart deviation score as ΣS= 5,31. The most insufficient item of the "Content Features" is "*Feedback is meaningful for the children (graphic, sounds and etc.)"*. Arithmetical mean of this item is 1.94. The most sufficient item of the "Content Features" is "*Child can set the pace of movement through leaving the content and exit at any time"*. Arithmetical mean of this item is 2.37. Other ten items except these two items' arithmetical mean scores changes between highest and lowest scores. But also low standart deviation score reflect that there is no significant changes on the views of students between the "Content Features".

According to the findings the "Content Features" of interactive instruction CDs which was designed for pre-school students are not qualitatively sufficient enough for instructions.

Table 4: Visual Features (N=67)

Survey Items	Arithmetic Mean	Standart Devation
1. Composition is appropriate for child (page design/size fit on the screen consistent alignment)	2,1644	,62886
2. Screen Design, content and image (picture, video and other images etc.) quality is appropriate for child	2,1587	,68310
3. The colors used for instructional content is appropriate for child's perception	2,3904	,70027
4. There is sufficient contrast between background colors and design and instructional content (design provide high contrast between instructional content and background for easily perception)	2,2288	,74427
5. Navigations (backward, forward, exit and etc. buttons and the features of buttons/color, position, size, font, constrast of button,) is appropriate for child	2,1577	,67695
6. Typographical features are appropriate for child (clear text, free of typos and grammatical appropriation)	1,4837	,64610
Total items score	12,5837	2,58461

The table 4 reflects the findings of "Visual Features" of interactive instruction CDs which was designed for pre-school students, present total arithmetic mean as $\Sigma\ \bar{x}$ = 12,58 and total standart deviation score as ΣS= 2,58. The most insufficient item of the "Visual Features" is "*Typographical features are appropriate for child (clear text, free of typos and grammatical appropriation"*. Arithmetical mean of this item is 1.48. The most sufficient item of the "Visual Features" is *"The colors used for instructional content is appropriate for child's perception"*. Arithmetical mean of this item is 2.39. Other four items except these two items' arithmetical mean scores changes between highest and lowest scores.

According to the findings the "Visual Features" of interactive instruction CDs which was designed for pre-school students are not qualitatively sufficient enough for instructions.

Table 5: Audio Features (N=67)

	Arithmetic Mean	Standart Deviation

Survey Items		
1. Character sounds are appropriate for child	1,9106	,83400
2. Scene musics are appropriate for child	1,9077	,82381
3. Navigation sounds are appropriate for child	1,9615	,80847
4. Instructional sounds are appropriate for child	1,9346	,81702
Total items score	7,7141	2,77411

The table 5 reflects the findings of "Audio Features" of interactive instruction CDs which was designed for pre-school students, present total arithmetic mean as $\Sigma \bar{x}$ = 7,71 and total standart deviation score as ΣS= 2,77. The most insufficient item of the "Audio Features" is *"Scene musics are appropriate for child"*. Arithmetical mean of this item is 1.90. The most sufficient item of the"Audio Features" is *"Navigation sounds are appropriate for child"* Arithmetical mean of this item is 1.96. Other two items except these two items' arithmetical mean scores changes between highest and lowest scores. But also low standart deviation score reflect that there is no significant changes on the views of students between the "Audio Features".

According to the findings the "Audio Features" of interactive instruction CDs which was designed for pre-school students are not qualitatively sufficient enough for instructions

Table 6: Audio-Visual Features(N=67)

	Arithmetic Mean	**Standart Deviation**
Survey Items		
1. Contents includes meaningfull and interesting animations through increasing motivation (audio-videos, two/three dimentional animations, moving and vocalized images and etc.)	1,9433	,72469
2. Animation contents are appropriate for child (character and character sound)	1,9558	,77121
3. Characters designed for animations are appropriate for child	1,9567	,79159
4. Content scenario is appropriate for child (design includes meaningfull scenario through instruction)	1,9067	,77494
Total items score	7,7625	2,61820

The table 6 reflects the findings of "Audio-Visual Features" of interactive instruction CDs which was designed for pre-school students, present total arithmetic mean as $\Sigma \bar{x}$ = 7,76 and total standart deviation score as ΣS= 2,61. The most insufficient item of the "Audio-Visual Features" is *"Content scenario is appropriate for child (design includes meaningfull scenario through instruction)"*. Arithmetical mean of this item is 1.90. The most sufficient item of the "Audio-Visual Features" is

"Animation contents are appropriate for child (character and character sound)". Arithmetical mean of this item is 1.95. Other two items except these two items' arithmetical mean scores changes between highest and lowest scores. But also low standart deviation score reflect that there is no significant changes on the views of students between the "Audio-Visual Features".

According to the findings the "Audio-Visual Features" of interactive instruction CDs which was designed for pre-school students are not qualitatively sufficient enough for instructions.

CONCLUSION

Effective use and choose of interactive learning tools engages students to use new and emerging information and communication technologies. Teachers may use films, slides, overhead projectors, and the latest technology in teaching, including computers, telecommunication systems, and video discs. The use of computer resources, such as educational software, internet and other devices exposes students to a vast range of experiences and promotes interactive learning. Through the technological opportunuties in instructional systems, students can communicate with students in other countries to gather information (Bureau of Labor Statistics 2005). The increasing use of multimedia opportunuties present different educational approaches to the student. Information and communication technology become part of teacher's instructional repertoire along with the increasing accountability demanded of early childhood and elementry grades (Cuban, 1986). Clark (1994) concluded that media and technology could be used to make learning more efficient (enable students to learn faster), more economical (save costs), and/or more equitable (increase access for those with special needs).

The basic components interactive instruction CDs include a high level of interactivity, interface, graphics, audio, video, text, graphics, comprehensive navigation and animation. Effective interactive instruction CDs encourage students for independent learning. The components of an interactive learning CDs include structured interactions that encourage learning but provide flexibility to allow the student to learn effectively. These components make interactive learning adaptable for the user, provide learners individualized pace, content and easy access. The effective use of interactive instruction CDs require high levels of interaction which means high quality and high frequency of interaction, support learning environments, improve the quality of instruction that allow user to get an individualistic approach to the content of instruction increase interest, motivate students to active participation to the instruction, provide discussion among students related the instruction and through these components carefully developed interactive instruction CDs present student centered instruction.

Interactive CDs have positive effects on learning and they are more motivating for students, if the contents is designed

carefully through the students' learning needs, auido-visual and mental perception and individual preferences. It means that there is a directly correlation between interactive instruction CDs quality and student learning quality.

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