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Early childhood teachers' thoughts and practices about the use of computers in early childhood education

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Abstract

This study was conducted to determine the thoughts and practices of early childhood teachers about the use of computers in early childhood education. The study has been carried out with 100 early childhood teachers who attended to a seminar about the early childhood education in Eskişehir and Afyon. To collect data, a "General Information Form" was used to determine the general characteristics of the teachers and their classroom, and a "Thoughts and Practices about the Use of Computers Questionnaire" was developed by the researchers and used in this study. The questionnaire includes a total of 11 questions related to the experiences, the purposes and the frequency of computer use; classroom assessments for activities with computer, thoughts about the status of children participate in activities and achieve goals of activities with computer. The results of the study show that the majority of the teachers acquire their information and skills of computer all by their experiences and state that computer use is appropriate in early childhood education. It is also stated that a major part of the teachers use the computer to support the activities in daily plans and include the computer 1-2 times at a week in their curriculum. Moreover, it is indicated that the teachers use the computer mostly in their music activities and intend to support children's cognitive development by activities with computer. In addition, suggestions were made regarding the correct and effective use of computers in education programs.
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1. Introduction

It is widely accepted that the technologies of information and communication are used in every steps of education today. The easier the use of technology is and the faster early childhood-software becomes widespread, the more prevalent children' technology use will become [1, 2]. The computer technology is used to facilitate teaching and learning in many early childhood education. Although the concerns about developmental convenience of technology have been announced, many studies have determined that technology has had positive influences on children' social, cognitive and sensual developments [3]. The studies have demonstrated that computers have supported the developments of the abilities of children' memory, communication and problem-solving [4]; the abilities of literacy [5, 6, 7, 8, 9]; and the ability of math [10, 11, 12]. In addition, Judge et al. [13] indicated that computers function correctly to the manners of children' learning as helpful, supportive and guide.

Computer's supportive influences on children' developments just depend on teacher's active inclusion in early childhood education program [14, 15, 2]. In addition, NAEYC [1] suggests the integration of technology to learning

atmosphere as one of the many elements supporting the cognitive and social abilities of children; however, it has emphasized that computers should be replaced with valuable learning centers such as block, art, sand and water games, books, dramatic game or discovery spaces in classrooms. In this respect, it is crucial that early childhood teachers should benefit from the use of computers in education programs. Similarly, Clements [16] stated that influential teachers used the activities of on-computer and off-computer together, balanced them and evaluated computer activities in group times as well as integrating computers into ongoing education programs.

The responsibilities of early childhood teachers about their evaluating the affects of technology over children and being ready for using technology for the benefits of children are critically significant [1]. Besides, Haugland [14] stated that learning will be more enjoyable when teachers start to regard computer as a tool of valuable learning and to combine computer activities with the other learning activities. In this sense, it is possible to say that individual willingness is highly important in order to integrate new improvements into classrooms [17]. Additionally, teachers can make computers' advantages more influential for children by realizing physical regulations carefully, giving assistance, selecting software programs and enriching learning in many ways [10]. Similarly, Judge et al. [13] expressed that computers had vital benefits on children' learning when they were used appropriately to development.

That's why, the education of teachers is highly important for using computers as an influential learning tool [14]. In the years of early childhood that make up the critical periods of development and learning, teachers should be supported to use computers effectively both in the times of pre-service and in-service. Hence, primarily the opinions and practices on the computer usages of early childhood teachers are significant. However, it is highly striking that the numbers of the studies, in which early childhood teachers' ideas and practices [15, 2, 24] were examined, are very few when the literature of this field is reviewed despite relatively numerous studies that are intended for determining the manners of teachers in the use of computer [18, 19, 20, 21, 22, 23]. So, this study is aimed at identifying the practices that early childhood teachers have realized with the help of computers and at determining their views on computer usage in education programs.

2. Method

The example of general browsing was used in this study. 100 early childhood teachers attended in a seminar that was held in Eskişehir and Afyon about the education of early childhood education in the spring semester of 2009-2010 school years. The related information about the teachers attending in study is submitted in Table-1 below:

Table-1. General Information about Participants

Variables	Sub-Categories	f	%
Graduation's Levels	Girls' Vocational School	35	36.8
	Child Development Associated Degree	26	27.4
	Child Development Teachers	6	6.3
	Early childhood Teachers	24	25.3
	Post-Graduate	4	4.2
Age	25 aged and below	49	51.6
	26-29	11	11.6
	30-34	13	13.7
	35-39	12	12.6
	Over 40 years of age	10	10.5
Seniority Year	1	32	33.7
	2	13	13.7
	3+	50	52.6
Type of school to be worked on	Private Primary School	3	3.2
	Private Nursery School	31	32.6
	Public Primary School	40	42.1
	Public Nursery School	21	22.1
Classroom Size	5-15 children	26	27.5
	16-26 children	69	72.5
Participation status in-service training about computers in early childhood education	Yes	19	20.0
	No	76	80.0
Status of computers in the classroom	Not	34	35.8
	There is one computer	61	64.2

| Internet connection status at the classroom | Yes | 31 | 32.6 |
| | No | 64 | 67.4 |

When the general information of the participants of this study was examined, most of them (%36.8) graduated from girls' vocational school, the percent of %27.4 graduated from child development associated degree and the rest of them (%25.3) graduated from early childhood teaching (undergraduate). Besides, it is obvious to see that the most of the participants' ages (%51.6) were 25 or subs and in the third or more working years. When we viewed the types of participants' school, it can be easily seen that the percentage of one's respectively working nursery schools in governmental elementary schools (%42.1), private nursery schools (%32.6) and governmental nursery schools (%22.1) are quite high. It is observed that the percentage of participants whose classrooms consist of between 16-26 children is %72.5, are higher than the ones consisting of between 5-15 children is %27.5. According to other findings in the table, it is possible to see that a large number of the participants (%80) did not participate in any in-service educations about computers in early childhood education; the percentage of the ones that had a computer in classrooms (%64.2) and the percentage of the ones that did not have internet connection (%67.4).

In that study, "The Form of General Information" and "Question Form of Evaluating Computer Use" in which some information like department, age, their working institutions, class size, the presence of computers and internet connection in classrooms etc. are shown and developed as a tool of gathering statics by surveyor were used. "Question Form of Evaluating Computer Use" makes up 15 questions -6 open-ended and 5 multiple choice types- in which the experiences of the teachers with computer use, their targets and frequencies, their related views on children' computer use, which development fields of children they supported by means of computer use, how they made an evaluation after computer use are asked. "The Form of General Information" and "Question Form of Evaluating Computer Use" are used. The data of the participants were analyzed by using a statistical program of `SPSS 18.0` Early childhood teachers' related opinions on computer use and their answers related to the practices were analyzed by means of the percentile, frequency distributions and content analysis.

3. Findings

The findings of the study are submitted in three categories. In the first one, the analysis results related to the participants' views on the computer use in early childhood education (Table-2); in the second one, the analysis results related to their views on the computer use (Table-3); in the third one, the analysis results related to their statements about the evaluation process after the computer use (Table-4) take place.

Table-2. Frequency and Percentage Values about Participants' Opinions towards Computer Usage

Question Items	Responding expressions	f	%
Is computer usage appropriate in early childhood education?	Appropriate	90	94.7
	Not appropriate	5	5.3
Do children get determined purpose and acquirements in the activities where you use computers?	Yes	67	70.5
	No	2	2.1
	Sometimes	26	27.4
Are activities where you use computer fun for children?	Yes	76	80.0
	No	0	0
	Sometimes	19	20.0
Does children's participation change according to sex in the activities where you use computer?	Does not change	88	92.6
	Girls	1	1.1
	Boys	6	6.3
How did you get information and skills about computer in early childhood education?	With my own experiences	65	68.4
	Through sharing with my workmates	37	38.9
	With Associate 's Degree	18	18.9
	With Bachelor's Degree	16	16.8
	With In-service Training	13	13.7
	With High School Education	10	10.5
	With Master's Degree	2	2.1

Based on Table-2, it is clear that almost all of the participants (%94.7) stated that they found the use of computer suitable in early childhood education. Besides, it is observed that a vast majority of the participants expressed that

they reached their particular targets in the activities by means of computers (%70.5), they found the activities with computers enjoyable (%80), the attendance of children in such activities with computers did not change based on sexes (%92.6). It is observed that the expression of *"with his/her self-experimental"* (%68.4) and the expression of *"by means of sharing with working companions"* (%38.9) took place on the participants' statements on information and ability acquisitions related to computer in early childhood education.

Tsitouridou & Vryzas [25] determined that early childhood teachers are positive and moderate towards computers in their studies in order to display teachers' using computers and its information technologies and their manners. In a similar study, Landerholm [26] indicated that a vast majority of teachers' personal and vocational attitudes were quite positive towards the use of computer in his search that was aimed at showing the attitudes of early childhood teachers and determining their information and practices. Positive attitudes towards the use of computer are regarded as the strongest marker. It is stated that it is related to the use of computers in classrooms, the acquisition of computer education, technological innovativeness, the background experiences of educators on computer and their attitudes towards computers [27]. The studies have shown that the attitudes of teachers and their beliefs have important functions on integrating computers into education activities [28, 29]. Although this study is not aimed at determining attitudes in reality, it is regarded as a promising finding since teachers' opinions on the use of computers in early childhood education were "suitable".

In addition, most of teachers stated in the study that they reached their targets in computerized activities for children. Technology can be combined easily with daily routines in the activities dedicated to the classrooms in early childhood education. The use of computer in the activities is highly crucial for providing active learning and a suitable education environment for problem-solving to children, supporting their individual learning, indicating the process based on the levels of their education and speed in learning [5, 30].

Clements & Samara [11] expressed that children demonstrated positive attitudes when they use computers particularly they displayed high interest and positive reactions when they use computers together with their peers. It is seen that this information corresponds to the statement that most of teachers regard the computer activities as enjoyable for children.

Clemets [10] and Işıkoğlu [2] indicated in their studies that the reactions of children towards computers differentiate based on sexes; accordingly boy children's performances on computers were better and more positive. Furthermore, Judge et al. [13] stated that teachers should benefit from the use of computers appropriately to the interests and requirements of children' developments with the intention of integrating them into important activities in order to create an atmosphere of equal education environment to all children. In this respect, that the attendance of children on the use of computer does not change based on their sexes is regarded as positive development, according to the opinions of most of teachers in our study.

The heavy increase of information and communication technology in every field has brought about teachers have needed computers in their daily and working experiences nowadays. The studies [26, 25, and 3] have stated that most of teachers have acquired the related experiences and information on computers in the university as well as using their own computers at home. . Kayak & Orhan [31] demonstrated in their studies, -which are aimed at showing what kind of responsibilities the information technology teachers take on except the curriculum in their schools- that most of information technology teachers helped classroom and branch teachers to conduct searches from internet. These findings show some parallelism with the study findings.

Table-3. Frequency and Percentage Values About Participants' Explanations about Computer Usage

Question Items	Responding expressions	f	%
Which purposes do you use computers for?	To support activities in my daily plans	66	69.5
	To search information/material in internet	49	51.6
	To make presentations	41	43.2
	To provide vocational development	38	40.0
	To support learning by using educational software	36	37.9
	To provide personal development	30	31.6
	For activities of assessment and evaluation	25	26.3
	For communicating with families and knowledge sharing	24	25.3
	For communication with other adults and knowledge sharing	15	15.8
How often do you give place to computer usage in activities you prepared in your program?	1-2 in a week	29	30.5
	Once in a month or less	21	22.1
	I don't allow for computer	15	15.8
	Two-three times in a month	11	11.6
	3-4 in a week	10	10.5
	Every day	9	9.5
In which activities in your education program do you give place to computer usage most?	Musical Activities	59	62.1
	Preparation for read write	43	45.3
	Math Activities	32	33.7
	Science-Nature Activities	29	30.5
	Game Activities	28	29.5
	Language Activities	27	28.4
	Drama Activities	25	26.3
	Art Activities	24	25.3
Which development areas of children do you intend to support most by using computer?	Cognitive development	61	64.2
	Language development	50	52.6
	Social emotional development	38	40.0
	Psychomotor development	29	30.5

When we view the Table-3, it is possible to see that most of the participants (%69.5) use computers for *"supporting the activities in daily plans"*, the rest of them (%51.6) benefit from the computers for *"searching information/materials on internet"*. Besides, most of the participants stated that the percentage of the ones using computers in their activities 1-2 days in a week (%30.5); the ones mostly using computers for the activities with music (%62.1); the ones using computers for the preparatory literacy activities (%45.3) can be seen; moreover, the percentage of the ones intending to develop mostly cognitive skills (%64.2), then the ones for language achievement (%52.6) can be observed.

Tondeur et al. [32] define three computer using types in classrooms: basic skills, the computer as a tool of information and the computer as a tool of learning. They mention about learning main operating systems such as using mouse and keyboard effectively in basic computer skills, educational objective of computers such as preparing presentations on computer, the search of information, correction and selecting the information in the second and third types of usages. Işıkoğlu [2] defines teachers' computer usages with two fields in the daily maintenance centers: Academic and social fields. Academic fields includes the acquisition of computer habits, the development of math and science skills, the development of literacy skills while social fields contain providing children' social communications, obeying the orders and rules. In a similar study, Van Braak et al. [27] define the computer uses of teachers in two different ways: the computer uses in classrooms (e.g. computer as tool for presentation, encouraging pupils to train skills, instructing pupils in the possibilities of computers) and supporting the use of computers (e.g. administration, preparing worksheets for the pupils, looking for information on the Internet for lesson preparation). In the light of this information, it can be understood that most of the teachers in the study have used the computers for the educational purposes.

Clements [10] stated that if children practice computer software 10 minutes in a day, that will increase their academic successes. Accordingly, when we consider the participant teachers have reached their particular aims, it has been an enjoyable activity for children and the attendance of children has not changed based on their sexes, the participants were expected to give enough and moderate place to the activities with computers in classrooms. On the other hand, it has been observed that most of participants used computers in their programs 1-2 times in a week.

Computer and internet present interesting multi-media sources to children for their music experiences. Music software supported by computers, high-quality music repertoire, visual and audio symbols, the communication and performance with music provide children with new learning chances about music [33, 34]. If the participant teachers

mostly use computers in music activities in classrooms, it can be regarded that they can help children support their cognitive and social developments as well as developing their music skills and creativity.

Besides, it is determined that the participants have used computers in the literacy activities based on their answers. In the years of early childhood education, some special software with computer has provided children with making up stories with the help of pictures on the computer screens, learning new words, identifying letters and recognizing the sounds of letters by means of reading software. Segers & Verhoeven [35] developed child-friendly computer software in order to improve the early literacy skills of children and they determined there were important improvements on the acquisitions of children' learning words. Similar studies also emphasize that the use of computers in early childhood period supports the increase of children' vocabulary, the fluency in speaking, early literacy skills and language developments positively [36, 37, 38, 39, 40, 41]. In addition, Işıkoğlu [2] indicated in her study,-she carried out with 4 teachers- , that children mostly used computers in leisure-time activities unlike the other activities. This finding shows some parallelism with the finding acquired from the study.

Furthermore, it is determined that most of the participants have aimed at supporting the cognitive and language developments with the computer activities. The use of computer in early childhood education develops the skills of cognitive process such as perception, deciding and problem-solving. The studies carried out show that the use of computers in early childhood education affects the developments of children' cognitive skills positively [42, 36, 38, 43].

Clements & Samara [11] stated that computer is an element of facilitating positive social interaction unlike the belief of computer's making children isolated. On the other hand, the study carried out by Bayhan et al. [15] indicated that early childhood teachers regarded computers as negative influences on social development. Our study also has observed that teachers have aimed at improving socio-sentimental developments of children by means of computers the less.

Table-4. Frequency and Percentage Values of Participants' Explanations about Evaluation Process after Computer Usage

Question Items	Responding expressions	f	%
Do you make evaluation for children after computer usage?	I use question and answer method	51	53.7
	I chat with children	42	44.2
	I want children express their emotions with paintings	17	17.9
	I use camera/video camera during activity , then I watch it again	14	14.7
	I use observation form	9	9.5
Do you evaluate yourself and the activity after computer usage?	I pay attention to children's participation into the activity	53	55.8
	I use camera/video camera during activity , then I watch it again	12	12.6
	I keep a report at the end of every single activity	10	10.5

When we look at Table-4, it is possible to see such statements mostly as evaluating children after computer use: the percentage of *"I am using the methods of question & answer"* is (%53.7); the percentage of *" I am talking to children"* is (%44.2). What's more, some of the participants' statements as a method of self-evaluating after computer use respectively is like that: the percentage of *"I take the participating of children into consideration"* is (%55.8); the percentage of *" I am using camera/video camera during the activities, then I am watching it again"* is (%12.6).

Some evaluations are carried out in order to support children' educations and developments and to realize their learning skills on higher levels in early childhood education. During evaluation period, children' already having information and motivations and that teacher should be aware of the strategies and results used in the process are highly important before children' acquiring new information. During the evaluation period, different techniques such as self-evaluation form, the record of observance, anecdotes and the evaluation form of acquisition are used [44, 45, 46]. In this step, the activities that are supported by technology guide teachers positively during the evaluation of children. Teachers are supposed to observe each child in order to support their learning in the computer centers [9]. Additionally, Clements [10] has conveyed that teachers can understand the children' intellectual processes by observing them. From this point, it can be said that teachers can support the information of field by using the evaluation techniques mostly based on observation in the results of the study.

4. Conclusions and Suggestions

This study has aimed at determining the levels of early childhood teachers' using computer. At the end of the study, it is seen that the participants found the use of computers in early childhood education widespread, they reached their particular aims in the activities with computer, the activities with computer were more enjoyable for children, the participation of children based on their sexes did not change in the activities with computer and teachers expressed they acquired the experiences and information about computer on their own. Furthermore, it is stated that a vast majority of teachers used computers to support the activities in their daily plans; they gave quite less place to the use of computers in their programs; they used computers mostly in the music activities and the preparatory works of literacy; they mostly aimed at supporting the cognitive and language developments in the use of computer.

It is highly vital that the use of computers in early childhood educations by teachers should be enough and moderate so as to support children' development and learning. Moreover, teachers are supposed to follow permanently growing technological innovations and to adapt these innovations into the education environment properly. In this study, although teachers have positive attitudes towards the use of computers in classrooms, it can be said that they need more proficiencies in terms of practice.

Additionally, based on the general information about the participants of the study it is determined that a vast majority of them did not participate in an in-service education about computers in early childhood education; most of them had one computer and no internet connection in classrooms though their classrooms consisted of 16-26 children. Each 4 children in equipped classrooms is supposed to have a computer to have active social interaction with their teachers and peers during the period of children' using computers [13]. Despite that, Downes et al. [47] point out that funds that are dedicated to support buying computers are not sufficient and too few computers have been purchased. Hence, Ministry of Education, non-governmental organizations, local administrations and other public organizations are supposed to provide financial aids to purchase enough computers and equipments in accord with the numbers of children cooperatively.

In addition to that, it is stated that almost all of teachers did not have any in-service education about computer in early childhood education before. However, the technological support and receiving education of teachers are really significant factors. Integration technology into the program and selecting reliable software are critically crucial for teachers in terms of supporting the learning and discovering of children [13]. It is necessary for teachers to have both pre-service and in-service educations in order to follow the latest technological trends, to be aware of the potential opportunities of technology and to have basic information and skills [10, 1]. For that reason, the seminars, education programs, conferences and workshops that Ministry of Education, universities and non-governmental organizations will carry out cooperatively are regarded as beneficial. Besides, it is regarded that the attitudes of early childhood teachers towards the use of computer, their beliefs, proficiencies and practices in the larger sample groups and the searching by using different methods will contribute to the literature of the field significantly.

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