Analysis of Computer Literacy Education in Terms of Self-Directed Learning

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Abstract

Within this study, self-learning processes of children who have never used a computer before were observed by leaving them alone with a computer. Afterwards, brief information was given to participants based on their level and questions were asked to arouse their curiosity. In this research where participants were left with a computer both individually and as a group, self and collaborative learning processes were organized. This study was conducted as an ethnographic action research in Diyarbakir which is a region with a mixed ethnic and cultural structure in Turkey. Within the scope of the research; observing computer and technology training process with a new perspective, accessing to detailed and authentic data on the learning process, measuring the effectiveness of self-learning and examining the impact of the peer education and cooperative learning on self-learning process were primary goals to be achieved. The work group consisted of 16 children and their ages ranged between 6 and 10. During the research process, field notes were taken, observations were made, thinking aloud notes, video and audio recordings were taken. At the end of the research, interviews were conducted with students, asking for what they have done and learned and their experiences in the process were asked. Children gave different names to the procedures and computer parts among themselves. At the end of the time they spent on computer, almost all of them improved themselves in using mouse and keyboard, learned the distinction between click and double clicks and closed the window they wanted. Within a few days on their own they learned tasks such as starting a game and playing, browsing the internet, opening and closing MS Office documents, writing via MS Word, and drawing through Paint. During the research it has been observed that boys were more willing to play games and make drawings using the Paint program while girls were more eager to search on the Internet and write texts using MS Word. Starting education process with young age groups in such a way is so crucial in that students will be able to internalize the value of the education provided by the teachers at the beginning stages of learning process. It has been thought that leaving students alone with educational materials or assignments at the beginning is not only effective in technology education but also in all educational processes and this fact needs further research to yield more results.

1. Introduction

Changing of learning habits every passing day with developing technology requires the differentiation of the teaching-learning process. Alvin Toffler, who has been defined as "the world's most famous futurist" by Financial Times indicated that "ignorants of the 21st century will not be the illiterate ones but will be those who cannot learn how to learn". Individuals, who cannot learn how to learn and who are not able to organize their own learning process, stay behind in many areas in globalizing world where the technology has been developing rapidly.

Prensky draws attention to the changing learning habits stemming from the use of Internet and web technology in his study, which describes people born after 1980 as "digital natives" while those born before are defined as "digital immigrants". Digital natives, growing with computer and developing "hypertext minds", process information in different ways and think in a different way from their teachers who grew up in an environment where printed sources were mostly used [16]. It is claimed that different stimuli and experiences lead to different brain structures, brain changes as a result organizes itself differently based on the inputs it receives [13]. Prensky mentioned that, the learning styles of today's students have radically changed and the teachers who teach students in the category of digital natives have remained as digital immigrants. [15].

In computer training, instructors are generally incapable of catching up with student's learning speed and they are insufficient in the process of guiding students. It is thought that if the process of children in which they discover and learn themselves is integrated into the educational process by observing in

detail and directed correctly, the efficiency of the training will increase. This is particularly of greater importance for the rural areas where the number of teachers is inadequate and delivery of educational opportunities is not enough. In the 21st century, in which the main role of the teacher is to arouse curiosity, we need to draw a path which aims to arouse awareness [10] and by which mainly children organize their self-directed learning.

1.1. Self-directed learning

Self-directed learning concept was first used by Houle in literature [17]; after that, different opinions have been claimed about the concept [11]. Self-directed learning is discussed as a process, as a learning approach by which individuals determine their own priorities and choose them from accessible various sources [14], or as an individual property [17].

Among these, Knowles's (1975) approach, which considered self-directed learning as a process, is generally agreed on. In self-directed learning, students access to information based on their needs and interests, rapidly and independently from time and place. Technological tools that facilitate access to information resources and online educator are extremely important in terms of self-directed learning [18]. Thanks to provided technological opportunities; information finding, transmission and storage tasks have been as close as a click for each learner, without the need for government agencies and without barriers [4].

1.2. Computer literacy and self-directed learning

Since Ministry of National Education in Turkey has adopted a constructivist educational approach by which individuals construct knowledge by themselves and teacher is regarded as a guide, self-directed learning has a support base. But when national literature is investigated, it has been found out that self-directed learning hasn't been combined with technology and children's point of view was not considered. It is emphasized that there is a need of studying technology education, especially in rural areas and countryside [9],[6].

Firstly, in a study called "Hole in the Wall", a computer, fixed on the wall at a public area in India, was allowed to be used by children and the process was observed [12]. In a few days, many of the children were able to browse the Internet, play games, create documents and paint pictures through the computer [7]. Groups of children were able to arrange and organize their own learning when appropriate resources were provided [8].

In "Hole in the Wall" and "One Laptop per Child" projects, which aimed to distribute a computer for each child, computer usage emerges as evidence of self-directed learning, increasing children's success. But the system, which suggests that children should be left completely alone, faced many criticisms as it had many disadvantages. Arora criticized "Hole in the Wall" for its being based on estimates and uncontrolled predictions. Some local teachers has stressed that without any educators or agents, educational process isn't efficient [1]. Within the scope of this research, taking lessons from deficiencies of similar studies, children's educational experience has been observed and pure data about their learning process which excludes prior learning have been reached.

2. Method

In scope of the study, a qualitative ethnographic research was conducted, examining the use of computers in the context of a culture. An analysis was conducted to examine mainly educational habits of individuals and the level of self-directed learning in technological area. Interpretative tradition, which is an ethnographic approach and also widely used in other disciplines as well as in education and applied fields, has dominated the working process [5]. Innovative, facilitator, and educator roles have been undertaken throughout the data collection process. Special attention has been paid during data collection phase for being a listener first and then a talker, and a participant-collaborative way of research was followed rather than imposing an educational system [2].

2.1. Procedures and data sources

Children who have not used or seen any computers before, were left alone with the computer initially as an individual and then in small groups. They have been told that they could touch the keyboard and mouse; the computer was turned on for them, but no explanation was made about usage. In addition, they have also been informed that it was not a compulsory activity and they could go whenever they wanted. After the first 3 days, brief information was given to arouse curiosity and they were allowed to work in groups. Computers were left for children's use for about 10 hours each day.

During the procedure carried out between 24 August and 2 September 2014, data source triangulation was followed to ensure the integrity, usefulness, and credibility criteria of the research. In addition, audio and video were recorded; observations and interviews were made, and thinking aloud protocol

was followed. Before the study, rapport was established with participants by spending time with them and information has been shared about how to think aloud during the research. During the process, language support was sought as people living in the research context generally speak Kurdish.

Research region: A village in Diyarbakır, which has one of the most heterogeneous natures in terms of social, economic and educational level in Turkey, was selected. The village is composed of approximately 200 households, which live on agriculture and animal husbandry. People's socio-economic level is low.

Selecting participants: The participants were selected from children in the 5-13 age range considering similar studies.

It is documented that, children's ability of self-directed learning is independent from their level of education, language, socio-economic status, ethnicity, gender, heredity, and intelligence [9]. For this research, diversity of the participants in the selected region has not constituted an obstacle, and furthermore it provided a mixed natural laboratory environment.

Work group: It consists of 16 children, including 13 girls and 3 boys, whose ages ranged from 6 to 10. All students' mother tongue is Kurdish and they learn Turkish at school. Participants' self-reported data about demographic characteristics such as age, prior computer usage, and literacy level were not found reliable. Therefore, accuracy of the demographic characteristics of children was triangulated through interviews made with school administrators, parents, and students.

3. Results

At the end of the process, children were observed to generally have difficulty in expressing what they do on the computer and what they have learned. They have given different names to computer processes and components. Almost all of them improved themselves in using mouse and keyboard, learned the distinction between click and double click, and closed the windows they wanted. Within a few days on their own, they learned tasks such as starting a game and playing, browsing the Internet, opening and closing MS Office documents, writing via MS Word, and drawing through Paint. It has been observed that boys were more willing to play games and make drawing while girls were more eager to search on the Internet and write texts. They generally tended to work with the gender of the same kind as an influence of the culture they grew up with.

It has been observed that many of the children went to work in the field and has been unable to participate in the study although they wanted and some are unable to attend school for the same reason or they start school late because of socio-cultural structure in the region. The children's mother tongue being Kurdish and their not knowing Turkish, which was software's language, hasn't constituted an obstacle in their learning.

In particular, answering children's questions with "I do not know" or "let's see what it is" has enhanced their curiosity even further; in traditional classrooms, students usually do not listen to teacher voluntarily, in this process they have looked forward to every single word from researcher's mouth and followed with great interest. It has been thought that leaving students alone with educational materials or arousing curiosity at the beginning is not only effective in technology education but also in all educational processes and this fact needs further research to yield more results.
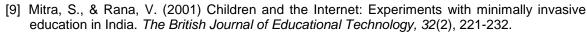
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