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# The views of science and technology teachers about computer assisted instruction

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The purpose of the study is to present the views of the teachers of Primary Science and Technology course about computer assisted instruction. Qualitative research was used in the study. In qualitative researches, the sampling group is small in order to examine the sampling in-depth. Semi-structured interviews were used in the study as data collection tools. The interviews were carried out with the teachers of Science and Technology Course. The participants were chosen from the primary schools located in the city centre of Bayburt. When the findings of the study, which aimed at revealing the views of the teachers of Science and Technology Course about computer assisted instruction, were examined, it was revealed that the teachers had basic knowledge about the benefits of computer assisted instruction practices. In the light of the findings, it was found that most of the teachers did not use computer assisted instruction practices in their lessons. The recent research about the effects of computer assisted instruction is limited in terms of duration and content. Therefore, extended studies in the long run and covering many courses are required.

## Introduction

The developing and changing technology is, undoubtedly, an indispensable need of today's people. People are required to acquire knowledge, skills, attitude, and habits to adapt to the technology and benefit from the opportunities it provides. In parallel with this condition, change and development has been inevitable in education and teaching as in every field (Turgut, Gurbuz & Turgut, 2012). Today, the individuals brought up are tried to be equipped with communication skills as well as reaching reliable information and organizing, evaluating and presenting knowledge (Akkoyunlu, 1995). The latest step taken in views to solve the problems in education systems is that using technology, especially communication technology, is inevitable to solve the problems just like in other sectors (Seniş, 1993). For that purpose, a lot of reasons have been suggested why computers, one of the new technologies and the name of this century, have begun to be used in education.

For instance, while social reality asserts that the students should be equipped with new

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technologies to get ready for the society; professional reality asserts that the children should be prepared in a technological society so that they can use technology professionally. However, pedagogical reality argues that computers will enrich the learning and teaching environment (Akkoyunlu, 1993).

Many problems have appeared such as the increase in the number of students in education, the instability which occurs between the teacher/ student ratings, and the complex contents depending on the rapid increase in the amount of knowledge on the other hand, the interest and demand in education have increased constantly and the individuals' desire to benefit from education opportunities more has featured individual teaching (Bindak & Çelik, 2006; Yiğit & Akdeniz, 2000). The use of computer in education has become compulsory due to such reasons related to both computer and education. Furthermore, the other reasons proposed for the use of computer in education are that the computer motivates students more, it promotes lifelong learning and enhances flexibility in curriculum (Alkan, 1997; Arseven, 1986; Töman & et al., 2012).

As known, many factors are effective in providing the development and change in education and teaching. One of the most important factors is the teachers. The teachers themselves are required to accept the change and especially be aware of the developments in technology to materialize change in their institutions (Baki, 2000; Hardy, 1998). It is considered that today many approaches are ineffective to raise the individuals with the desired qualities, so one of the most effective way for solution is to benefit from the opportunities provided by education technologies, especially the computers (Yiğit & Akdeniz, 2000; Töman & et al., 2012; Yeşilyurt, 2006). Particularly, such reasons as the disproportional change in the number of students and teachers, the complex content depending on the amount of knowledge and giving importance to the practises which highlight individual differences lead the individuals to benefit from the computers as educational tools (Alkan, 1998; Uşun, 2000).

In order to use computer technologies effectively and efficiently in education and teaching, the attitudes of the individuals, with whom they are involved in interaction, and their views about this type of teaching have an important role. Among the most important factors intended for the use of contemporary innovations in education system are the views of the users such as teachers (Bindak & Çelik, 2006; Deniz, 2005).

### *The Purpose of the Study*

The purpose of the study is to present the views of the teachers of Primary Science and Technology course about computer assisted instruction.

## Method

Qualitative research was used in the study. Qualitative research is a method of inquiry which generates data without any statistical operations or other numerical tools (Çepni, 2009). Susceptibility to natural environment, the participant role of the researcher, having a holistic approach, putting forth the perceptions, flexibility in research design and having inductive analysis are the important features of qualitative research techniques (Yıldırım & Şimşek, 2004).

### *Sampling*

Purposeful sampling was used in the research. In qualitative researches, the sampling group is small in order to examine the sampling in-depth. Therefore, purposeful sampling is preferred to random sampling (Munn & et al., 1990). In this sampling, criteria which are

important for the selection are determined and the sampling selected according to these criteria is thought to represent the population with its all qualities (Yin, 2003). So, the interviews were carried out with the teachers of Science and Technology Course. The participants were chosen from the primary schools located in the city centre of Bayburt. The names of the participants were not used due to research ethics. Therefore, the participant teachers were named after the codes of Ö1, Ö2, Ö3, Ö4, Ö5. The qualities of the teachers were presented in Table 1.

**Table 1:** The qualities of the teachers

| Participants | Professional Experience (year) | Post | Gender |
|---|---|---|---|
| Ö1 | 17 | Primary School Teacher | Female |
| Ö2 | 8 | Primary School Teacher | Female |
| Ö3 | 6 | Primary School Teacher | Male |
| Ö4 | 9 | Primary School Teacher | Female |
| Ö5 | 10 | Primary School Teacher | Male |

### *Data Collection and Analysis*

Semi-structured interviews were used in the study as data collection tools. This technique has advantages since it gives opportunities to ask in-depth questions about specific issues and ask the question again to clarify the situation and complete the responses if the response is incomplete or unclear (Çepni, 2009).

One of the researchers carried out the interviews with the participants and the interviews were recorded with the recorder after getting the consent of the participants. The data recorded after the interviews were transcribed. Then, the texts were given to the participants to verify the accuracy and completeness of the data and so the reliability of the data was obtained. In data analysis, content analysis methodology was used. Content analysis is defined as a systematic, replicable technique which summarizes the words of a text with smaller content categories that relies on the coding based on specific inferences (Büyüköztürk & et al., 2008). The raw data obtained from the interviews were coded and categories were determined. The data were grouped under these categories and made meaningful for the reader. The coding and categorization process were carried out repetitively by one of the participants. Hence, the irrelevant codes were removed relying on the problem and purpose of the research and the new codes were added to the parts considered necessary. The researchers acted together to name the categories. The tables which presented the views of each participant about the subject were obtained. Furthermore, the validity of the questions were obtained via expert views, relevant literature and piloting. The flow chart of this study was given in Diagram 1. Moreover, the findings obtained from the analysis were presented in detail in the next section of the study.

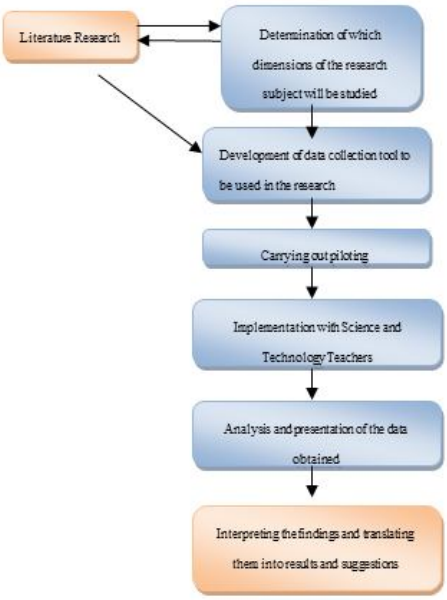


**Diagram 1:** Flow chart of the study

## Findings and Interpretations

The findings obtained from the teachers were presented in the tables for each question.

**Question 1**: "What are the qualities of a teacher required in computer assisted instruction?"

The responses of the teachers to question 1 were presented in Table 2.

**Table 2:** The analysis results of the teachers' responses for question 1

| TEACHERS | CATEGORIES | |
|---|---|---|
| | **The qualities required** | **Reasons** |
| **Ö$_1$** | A teacher should know the programs related to his/ her field of study. | Organization of a teacher's own work<br>A teacher's finding him/herself in a difficult predicament in the eyes of the students |
| **Ö$_2$** | A teacher should have adequate equipment and tools. | A student studying not theoretically but practice-oriented<br>Doing more exercises with the students |
| **Ö$_3$** | A teacher should have adequate equipment and tools. | Active participation of each student in learning process<br>Students' having richer content in terms of sources |
| **Ö$_4$** | A teacher should have adequate equipment and tools. | Students' benefiting from the visuals<br>Students' having richer content in terms of sources |
| **Ö$_5$** | A teacher should have adequate equipment and tools. | Active participation of each student in learning process<br>Students' having richer content in terms of sources |

The responses of the teachers to the question "What are the qualities of a teacher required in computer assisted instruction?" were grouped under two categories. These are "the qualities required and Reasons".

When the qualities a teacher are considered, four teachers determined that the teacher should

have adequate equipment and tools. One teacher stated that a teacher should know the programs related to his/ her field of study. When the reasons for the responses of the teachers were analysed, the teachers usually determined that students should have richer content in terms of sources. On the other hand, the reasons for the qualities required in computer assisted instruction and their range of frequency with regard to teachers were presented in Table 3.

**Table 3:** The views of the teachers related to the reasons for the qualities of a teacher required in computer assisted instruction

| Reasons | Frequency |
|---|---|
| Organization of a teacher's own work | 1 |
| A teacher's finding him/herself in a difficult predicament in the eyes of the students | 1 |
| A student studying not theoretically but practice-oriented | 1 |
| Doing more exercises with the students | 1 |
| Active participation of each student in learning process | 2 |
| Students' having richer content in terms of sources | 3 |
| Students' benefiting from the visuals | 1 |

The general view of the teachers is that a teacher needs to have a richer content with regard to sources than the students in computer assisted instruction. It was determined that this condition resulted from the teachers' having adequate equipment and tools. Moreover, two teachers stated that each student should have adequate equipment and tools to participate actively in learning process. A teacher's (Ö4) statement about the students' having richer content with regard to sources is remarkable: "*…I think that it is efficient in line with the educational websites. Accessibility to the desired information is provided at any time with the help of the Internet. "*

Another teacher ($Ö_3$) used the following expressions about each student's active participation in learning process:

*"The students can develop their mental intelligence more easily with visual educational programs. In other words, a student is active in learning process and it is quite important for a student that s/he should learn by doing and experiencing."*

**Question 2:***"What are the benefits of computer assisted learning? Why?"*

The responses of the teachers to question 2 were presented in Table 4.

**Table 4:** The analysis results of the teachers' responses for question 2

| TEACHERS | CATEGORIES | |
|---|---|---|
| | **From the point of teachers** | **From the point of students** |
| **$Ö_1$** | Save time<br>Giving opportunities to solve more questions | Permanent knowledge by means of the visuals<br>Having a richer content with regard to sources |
| **$Ö_2$** | Reaching information in the fastest way | Permanent knowledge by means of the visuals |
| **$Ö_3$** | | Having a richer content with regard to sources<br>Student's learning to study collaboratively<br>Permanent knowledge by means of the visuals |
| **$Ö_4$** | Enabling teacher to be multi-faceted | Permanent knowledge by means of the visuals |
| **$Ö_5$** | Save time<br>Giving opportunities to solve more questions | Studying not theoretically but practice-oriented<br>Permanent knowledge by means of the visuals |

When Table 4 was examined, the responses of the teachers to question 2 were grouped under two main themes. These are the benefits of computer assisted instruction on teachers and the benefits of computer assisted instruction on students. While all of the teachers except Ö3 stated the benefits of computer assisted instruction from the point of teachers and students, only Ö3 mentioned the benefits on students.

When the benefits of computer assisted instruction on teachers were examined, two teachers stated that computer assisted instruction had benefits on teachers from the point of saving time and enabling teachers to solve more questions. One of the teachers of two other teachers stated that it was easier to have access to knowledge by means of computer assisted instruction and the other teacher stated that it might be useful for the teachers to gain multi-faceted qualities. The response of Ö1 explains this situation:

*"We use computer assisted instruction at each stage of the lesson. Particularly, I believe that it is very beneficial while solving many problems with the students. We can also concretise abstract knowledge with the slides. Therefore, we can enable the learning to be more efficient and permanent. The student understands better and learns more efficiently by designing and forming an image in his mind. I can say that saving time is one of the most important advantages of computer assisted instruction while realising all these things. ."*

The views of the teachers about the benefits of computer assisted instruction on students were presented in Table 5 and the frequencies for the teachers who agreed with the views were given opposite the items.

**Table 5:** The views of the teachers about the benefits of computer assisted instruction on students

| **Benefits** | **Frequency** |
|---|---|
| Permanent by means of the visuals | 5 |
| Having richer content with regard to sources | 2 |
| Students' learning to work collaboratively | 1 |
| Studying practice-oriented but not theoretically | 1 |

The general views of the teachers was that computer assisted instruction might be useful for students to have permanent knowledge by means of the visuals. Two teachers stated that the students could have richer content with regard to sources. Furthermore, one of the teachers stated that computer assisted instruction could be useful for students to learn to work collaboratively. One teacher stated that students might be engaged in practice-oriented study but not theory-oriented study. The expressions of Ö5 about the permanency of knowledge were given as an example:

"*It enables the lessons to be understood more easily in school which leads to success in lessons. Reinforcing the elements envisaged by means of the visuals enable the knowledge to be permanent."*

**Question 3:** "What are the disadvantages of computer assisted instruction? Why?"

The responses of the teachers to question 3 were presented in Table 6.

**Table 6.** The analysis results of the responses of the teachers to question 3

| TEACHER | CATEGORIES | | |
|---|---|---|---|
| | **From the point of teachers** | **From the point of students** | |
| | | ***Physical*** | ***Social*** |
| **Ö$_1$** | Teacher's not having computer technology background<br>Can prevent the teacher from obtaining the essential knowledge required among a lot of knowledge | Health problems such as backache and eye disorders | Less one-to-one interaction and communication with the teacher<br>Having an easy access to some websites with bad contexts such as gambling and betting websites on the internet |
| **Ö$_2$** | You cannot do the lesson due to a short power failure<br>An assistant who constantly checks the computer system is needed | | Communication and talk with peers at a lower level<br>Less one-to-one interaction and communication with the teacher |
| **Ö$_3$** | An assistant who constantly checks the computer system is needed | Health problems such as backache and eye disorders | Less one-to-one interaction and communication with the teacher<br>Having an easy access to some websites with bad contexts such as gambling and betting websites on the internet |
| **Ö$_4$** | An assistant who constantly checks the computer system is needed | | Communication and talk with peers at a lower level |
| **Ö$_5$** | Teacher's not having computer technology background | Health problems such as backache and eye disorders | Communication and talk with peers at a lower level |

When Table 6 was examined, the responses of the teachers to question 3 were grouped under two main themes. These are the disadvantages of computer assisted instruction on teachers and the disadvantages of computer assisted instruction on students. Moreover, the disadvantages of computer assisted instruction on teachers were grouped under two sub-categories as "physical and social disadvantages" according to the responses of the teachers. When the disadvantages of computer assisted instruction on teachers were examined, most of the teachers drew the attention on "the need for an assistant who constantly checks the computer system and the teacher's not having computer technology background". Ö4 explained the need for an assistant who constantly checks the computer system with the following expressions:

"*There is a point to be mentioned when discussing the disadvantages of computer assisted instruction. To me, this point has escaped the attention but it is a very important point. Therefore, every teacher may not know everything about computers. In such a case, when a problem arises which a teacher cannot deal with, a teacher needs an assistant who constantly checks the computer system.*"

Ö$_5$ mentioned the teachers' not having computer technology background with the following expressions:

"*If the educator or teacher is beneficial or s/he is equipped with adequate technological knowledge in computer assisted instruction, they are good for the students, but if the teacher is unqualified, this causes some problems in computer assisted instruction.*"

Furthermore, Ö$_2$ emphasised that a problem occurs while teaching a lesson even during a

short power failure and $Ö_1$ determined that a teacher could experience problems while trying to obtain the essential knowledge required among a lot of knowledge.

The responses of the teachers about the disadvantages of computer assisted instruction on students were grouped under two sub categories. These are "physical and social disadvantages". All the teachers except $Ö_2$ stated that computer assisted instruction could cause some health problems such as backache and eye disorders. $Ö_1$ used the following expressions:

*"While discussing the disadvantages of computer assisted instruction, it can be logical to group them under headings. The most important one is the physical problems with the children. If we have to describe in detail, especially the children at an early period of their upbringing come face to face some health problems such as backache and eye disorders when they have an instruction on computer."*

It was determined that the teachers who mentioned the social sides of the disadvantages of computer assisted instruction created on the students mostly discussed the less one –to-one interaction and communication with the teacher and the communication and talk between the students and their peers at a lower level. To give an example, the statements of $Ö_2$ the issue draw attention:

*"Computer assisted instruction completely ignores sociability. Because the use of computer is individualistic, it affects the homework and group work to be done together. Sociability, talk, and communication occur at a lower level."*

Moreover, $Ö_1$ and Ö3 stated that it was possible to have access to the websites with bad contexts such as gambling and betting websites on the Internet by means of computer assisted instruction. The disadvantages of computer assisted instruction on students were presented in Table 7 with the frequencies opposite the items.

**Table 7:** The disadvantages of computer assisted instruction on students

| **The disadvantages on the students** | | **Frequency** |
|---|---|---|
| ***Physical*** | Health problems such as backache and eye disorders | 4 |
| ***Social*** | Having communication and talk with peers at a lower level | 3 |
| | Less one-to-one interaction and communication with the teacher | 3 |
| | Having an easy access to some websites with bad contexts such as gambling and betting websites on the internet | 2 |

***Question 4:*** *"Do you use the computer assisted instruction practises in your lessons?" The responses of the teachers to question 4 were presented in Table 8.*

**Table 8:** The analysis results of the responses of the teachers to question 4

| ***TEACHERS*** | ***CATEGORIES*** | |
|---|---|---|
| | **State of Preference** | **Reasons for Preference** |
| **$Ö_1$** | I do not use it | There is not enough equipment and tool in the school |
| **$Ö_2$** | I do not use it | Use of visual and audio materials<br>Enabling permanent learning |
| **$Ö_3$** | I do not use it | There is not enough equipment and tool in the school |
| **$Ö_4$** | I do not use it | Use of visual and audio materials<br>Enabling permanent learning |
| **$Ö_5$** | I do not use it | There is not enough equipment and tool in the school |

The responses of the teachers to the question "Do you use the computer assisted instruction practises in your lessons" were grouped under two categories. These are the "State of preferences and Reason for preferences". It was determined from the responses of the teachers that three teachers did not benefit from computer assisted instruction practices. The reasons for their not being able to use computer assisted instruction was that their school did not have enough equipment and tools. To exemplify it, the response of $Ö_3$ was as follows:

*"We do not use computers in our lessons adequately. The reason is that when I first started teaching, there was not enough environment and opportunities for computers. Later, there were opportunities but we did not have enough opportunities to use. We said it was about to happen, we were going to use it in our classes but unfortunately we could not start to use the computer."*

The reasons for the two teachers who stated that they benefited from computer assisted instruction in their lessons were that they used visual and audio materials and enabled permanent learning. The following statements of a teacher ($Ö_4$) about benefiting from computer assisted instruction practices draw attention:

*"Because it is visual, the visual shootings draw attention and they are remembered easily. Because the voices are similar, exactly the same and not restricted to the book, they are effective. The students are very much interested in them."*

**Discussion and Results**

When the findings of the study, which aimed at revealing the views of the teachers of Science and Technology Course about computer assisted instruction, were examined, it was revealed that the teachers had basic knowledge about the benefits of computer assisted instruction practices. Moreover, most of the teachers who had basic knowledge about the benefits of computer assisted instruction practices, stated that their schools were not equipped with enough equipment and tools. It was thought that due to this condition, the teachers could not benefit adequately from the computer assisted instruction opportunities in their schools. It can be concluded that the teachers believed that computer assisted instruction not only enabled the knowledge to be permanent by means of the visuals but also provided a richer content with regard to sources. It can also be concluded that the view that computer assisted instruction had benefits for teachers such as saving time and solving more questions related to the subjects in the lessons was predominant. Similar results to these findings were determined in literature (Yeşilyurt, 2006).

It was revealed in the views of the teachers that there were some disadvantages of computer assisted instruction which resulted from the teachers' not having technological background and need for a permanent assistant for the technical issues. Moreover, it was concluded from the point of teachers that computer assisted instruction could cause problems for students in social context between their teachers and peers and physical health problems such as backache and eye disorders. Bindak and Çelik (2006) and Deniz (2005) obtained similar results in their studies.

In the light of the findings, it was found that most of the teachers did not use computer assisted instruction practices in their lessons. The teachers' not having enough technology infrastructure in their schools was considered to be the reason for that.

## Recommendations

(1) The advantages of computer assisted instruction must be benefited from in order to have the students acquire such features as using the scientific process skills suggested by today's learning and teaching methods, determining the existing problem status and the solution of the problem, thinking objectively, making the right decision, and learning to learn.
(2) The computer laboratories and the possibilities for the equipment in the schools must be developed and improved. Computer must be regarded not as a purpose in education but as a means to promote teaching for the teachers and students.
(3) The recent research about the effects of computer assisted instruction is limited in terms of duration and content. Therefore, extended studies in the long run and covering many courses are required.

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