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# Formation of information culture of students through information technology

**Almash Turalbayeva** [a *], Abai Kazakh National Pedagogical University, Institute of Pedagogy and Psychology, Department of Professional Training Educational Program, 13 Dostyk Ave., Almaty, 050010, Kazakhstan. https://orcid.org/0000-0002-7147-9528

**Akgul Zhubandykova** [b], Kazakh National Women's Teacher Training University, Department of Preschool and Primary Education, Graduate School of Pedagogy and Psychology, 12 ZetuKaznastr, Almaty, 050053, Kazakhstan. https://orcid.org/0000-0003-4545-2599

**Roza Nabuova** [c], Kazakh National Women's Teacher Training University, Department of Preschool and Primary Education, Candidate of pedagogical Sciences, associate Professor, 7Mamyr, Almaty, 050036, Kazakhstan. https://orcid.org/0000-0002-6887-4850

**Klara Buzaubakova** [d], M.Kh. Dulaty Taraz Regional University, Institute of «Ustaz», Department of Management in education, 7 Suleymenov str., Taraz, 080000, Kazakhstan. klara_1101@mail.ru https://orcid.org/0000-0002-9124-9893

**Gulmira Mailybaeva** [e], Zhansugurov Zhetysu University, 187A Zhansugurov str., Taldykorgan, 040009, Kazakhstan https://orcid.org/0000-0003-0420-4142

**Gulzhan Abdullina** [f], Khoja Akhmet Yassawi International Kazakh-Turkish University, Department of education technologies, 29B.Satarkhanov Ave., Turkestan, 161200, Kazakhstan. https://orcid.org/0000-0001-8159-5234

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**Abstract**

The aim of this research is to evaluate the formation of students' knowledge culture through information technology with student views. In the research, qualitative methods were used to collect the data, and the content analysis method was used for the analysis of the data. The data were collected by the researcher through semi-structured interview forms prepared for the teacher and the students. The participants of the research consisted of 40 primary school 4th grade students studying in Almaty, Kazakhstan in the 2020-2021 academic year. The results of the research reveal that students sometimes benefit from information technologies while doing research for information purposes and for doing their school homework. At the same time, as a result of the research, it was determined that the students always benefited from information technologies for activity purposes. The results obtained from the research reveal that education systems, teachers and parents have great duties in the effective use of information technologies by students.

Keywords: information culture, information Technologies, information technology; student competencies, student opinions

* ADDRESS FOR CORRESPONDENCE: Almash Turalbayeva[a] *, Abai Kazakh National Pedagogical University, Institute of Pedagogy and Psychology, Department of Professional Training Educational Program, Kazakhstan.
*E-mail address*: turalbaeva_a@mail.ru

## 1. Introduction

Today's world reflects the development process of modern societies, equipped with information Technologies, where knowledge is built. In societies dominated by information technologies, individuals participate actively to increase the social value of learning. Accordingly, the bond that students establish with information technologies in and out of educational opportunities in the development process gains importance day by day (Tu & Corry, 2002).

### *1.1. Theoretical and conceptual framework*

Education has traditionally been a field of continuous evolution since the beginning of time. As part of this evolution, technology has recently taken an important place in education. However, although technology seems to refer to computers today, it may not be enough to limit ourselves to these. The use of computers in education serves to help gain knowledge, analyze student reactions and analytics, strengthen student learning, and develop autonomous abilities (Laborda, Uzunboylu, & Ross, 2016). In today's world, which we call the age of technology, it is generally accepted that computers have important effects on people's learning and behavior (Martinovic & Zhang, 2012).

All technology elements, including communication and computer-based technologies that allow information to be collected, processed, stored, and transmitted from one point to another with the help of networks, are called information technology. In recent years, human life, shaped by technology, is in an effort to keep up with the rapidly changing and developing new world understanding. This effort to keep up is realized to the extent that individuals can provide action adequacy regarding information technologies. Today's technology users need application-based skills to do their routine, professional and hobby work, in short, to meet their needs. Skill appears as an element of competence that shows how an individual will do something. Information technology competence is defined as the ability of individuals to carry out a process that includes learning, development and teaching by using their own potential and information technologies (Kaasbøll, 2014). It is possible to say that information technology competence is related to the use of technology in the information management and process, which includes all technologies for the processing and transmission of information (Yazcayir & Selvi, 2014).

Today, information technologies have a significant impact on information societies. After the technologies started to become widespread and used in society, change became inevitable. This change has also affected the education systems developed to raise individuals in line with the needs of the society. The necessity of raising individuals in accordance with the information age, specific to the information society, while considering the characteristics has emerged. Considering the characteristics of information societies, it is clearly seen that a period in which it is impossible to think of student-oriented programs independently of technology has begun (Aydin, 2003).

The existence of various reflections of information and communication technologies in every aspect of daily life has brought with it the necessity of improving the skills of today's individuals in the use of information and communication technologies (Sad and Nalcaci, 2015). In addition, the ease of accessing information through information technologies and the fact that the learning platform is more fun than classical learning methods have increased the orientation of individuals to this field (Soykan, 2015).

Information technologies create opportunities for the development of information culture through the effective and productive organization of students' independent work (Nazarova, Zhakulova, & Seitmuratov, 2021). Developing information technologies, on the one hand, made the use of e-learning widespread, on the other hand, revealed new competencies that users should acquire. The most important feature of technological learning is that it is internet-based and can be accessed from anywhere. In addition, in order to benefit from these internet-based education platforms, devices with relatively expensive new technologies such as laptop computers, smart phones, and tablets should be used. There are many factors that affect the success of students using technological learning platforms. The fact that students do not have the necessary knowledge and skills to use online education platforms affects their success levels in online platforms, as well as the lack of internet connections and devices to be used in e-learning or being reached at an older age than their peers (Mailizar et al., 2020).

### *1.2. Related research*

In terms of carrying out educational activities, technology-based learning and teaching activities are encountered in almost all innovative approaches in recent years. Especially in the last two years, the rapid transition from face-to-face education to distance education due to the worldwide Covid-19 pandemic has brought along the debates on competency in learning technologies. The adequacy of the current information technologies internet structure, the reorganization of learning environments through information technologies, the tendencies and competencies of teachers and students to use information technologies effectively have become the main problems discussed in the literature on learning and teaching activities (Carolan et al., 2020).

Balkan (2018) evaluated the technology perceptions of primary school 4th grade students in his research. Research findings showed that students have similar perceptions towards technology and associate the concept of technology more with high-tech products. As a result of the research, students who define technology as things that make things easier also stated that technology has positive and negative aspects.

In their research, Muilenburg and Berge (2005) emphasized the necessity and importance of students having internet connections in order to be able to use educational platforms equipped with information technologies and pointed out the difficulties in acquiring this habit by students who do not have sufficient equipment. Liao (2007) compared the effects of computer-assisted teaching and traditional teaching methods on student achievement in his study evaluating the effect of computer-assisted teaching processes on students' success. As a result of the research, it has been revealed that computer-assisted education provides a more effective learning opportunity than traditional teaching methods.

Boshuizen and Wopereis (2003), on the other hand, in their research on the integration of information and communication technologies into teaching processes, revealed that information and communication technologies increase student achievement, improve students' high-level thinking skills, and in addition, create quality and equal opportunity in education. Aydogan (2013) in his research examining the attitudes of 8th grade students towards information technologies, stated that the students' apathy and anxiety sub-dimension scores of the students' attitude scale towards information technologies are at a relatively moderate level. In addition, as a result of the research, the

fact that the addiction and interest sub-dimension scores were at a moderate level showed that the students had positive attitudes towards information technologies.

### *1.3. Purpose of the research*

The aim of this research is to evaluate the formation of students' knowledge culture through information technology with student views. Depending on this purpose, answers were sought for the following sub-objectives.

1. What are the students' views on using information technologies while conducting research for information purposes?

2. What are the students' views on using information technologies to do their school homework?

3. What are the students' views on using information technologies for activity purposes?

## 2. Method and Materials

This section includes information about the research model, participants, data collection tools, data collection process and data analysis.

### *2.1. Research method*

In this study, qualitative methods were used to collect data, and content analysis method was used for data analysis. This method helps to understand the views, perceptions, and approaches of students in depth and to classify them under certain code headings. Berg and Lune (2012) state that it is not entirely correct to classify content analysis studies as qualitative or quantitative, and they can be both qualitative and quantitative at the same time. Expressing data with numbers in qualitative studies is beneficial in terms of allowing comparisons between categories. The longitudinal nature of the data collection process of this study made it important to determine the number of code repetitions and make comparisons, and it also gained a partial quantitative feature by making use of some descriptive statistics in the analysis part of the study.

### *2.2. Participants*

The participants of the research consisted of primary school 4th grade students studying in Almaty, Kazakhstan in the 2020-2021 academic year. In line with the purpose of the study, the convenient/convenient sampling selection method was used to determine the study group. Convenience sampling is a frequently used sampling type in qualitative research (Patton, 1997), and items that are convenient and easy to reach among the existing items are determined as samples. The participants of the research consisted of 40 primary school 4th grade students who voluntarily agreed to participate in the research.

Demographic information of the research participants is given in the table below (Table.1).

Table 1. Information on the demographic characteristics of the students

| | **F** | **%** |
|---|---|---|
| **Female** | 23 | 57,5 |
| **Male** | 17 | 42,5 |
| **Sum** | 40 | 100 |

In Table 1, the gender distribution of primary school 4th grade students who voluntarily participated in the research is given. 57.5% of the students participating in the research are girls and 42.5% are boys. Based on this, it was concluded that female students showed more interest in the research than male students.

*2.3. Data collection tools*

In order to collect qualitative data in the research, a semi-structured interview form developed by the researcher in accordance with the purpose and sub-objectives of the research was used. In the semi-structured interview form, there was one demographic question to determine the gender distribution of the students and 3 questions to get their views on the formation of an information culture through information technologies. In order to determine the appropriateness of the questions prepared during the development of the semi-structured interview form, the opinions of 2 field experts were taken. One of these experts is a primary school teacher who teaches primary school 4th grade students, and the other is a computer and instructional technology specialist. Experts stated that the questions could be used exactly as they were, except for a few typos. The final form of the semi-structured interview form was created by making the necessary adjustments in line with the expert opinions. After the interview form was prepared, a pilot interview was conducted with three students and the answers given by the students to the questions were analyzed and it was checked whether there were any items that the students could not understand. As a result of the pilot application, it was concluded that the semi-structured interview form was ready for application. Pre-interviewed students were excluded from the research.

The questions in the semi-structured interview form are given below.

1. How often do you use information technologies while conducting research for information purposes? What are your views on this matter?

2. How often do you use information technologies to do school homework? What are your views on this matter?

3. How often do you use information technologies for activity purposes? What are your views on this matter?

### *2.4. Data collection process*

One of the possible stages where ethical violations can occur in scientific research is the data collection stage (Merriam & Tisdell, 2015). In this process, in order to show that there is no room for ethical violations and to enable the students to express their thoughts freely, the purpose of the study was explained first and then the students were specifically asked not to write their names or any personal information on the papers on which they conveyed their opinions. Considering the conditions of the covid-19 pandemic, the interviews with the students were carried out in accordance with the social distance rules. Semi-structured interview forms were sent to some of the students via e-mail by reaching their parents. The students who could not be reached via e-mail were handed the form and received again by the researcher when it was filled. Research data were collected in 6 weeks.

### *2.5. Data collection analysis*

Data analysis in qualitative studies requires meticulous work and good planning of the process. During the coding studies, the data was approached sensitively, categories were created that could include all the data at hand, the relevant data was placed only in a single category to which it belongs, and conceptual harmony was achieved within and between the categories, thus complying with the data analysis criteria of Merriam and Tisdell (2015). No special qualitative data analysis software was required for this study. The frequency of repetition of the main codes and sub-codes was obtained by the content analysis method. Descriptive statistics values were obtained by using MS Excel software. The opinions of the students who participated in the research were directly quoted and S-1, S-2, S-3…. are given in the tables created by coding.

## 3. Results

In this section, the answers given by the students who participated in the research to the questions in the semi-structured interview form are included.

In Table 2, the views of the students regarding the use of information technologies while conducting research for the purpose of obtaining information are given.

**Table 2**

*Students' views on using information technologies while conducting research for information purposes*

| | **Sum** |
|---|---|

| | | F | % |
|---|---|---|---|
| **I always prefer** | *I always use the internet to get information (S-6 student).*<br>*I always research the things I am curious about on the computer (S-11 student).*<br>*I do research regularly. There are things that I wonder. I'm looking for them on the internet (Student code S-22).*<br>*My mom says that I can find the things I'm curious about faster on the internet. That's what I do too (S-12 student).*<br>*I occasionally use the internet to do research (S-14 student).* | 15 | 37,5 |
| **I sometimes prefer** | *Not always. I mostly search from books, but sometimes I look on the internet (S-33 student).*<br>*Sometimes I do research online. When there are things, I'm curious about, I look at them (S-25 student).* | 23 | 57,5 |
| **I never prefer** | *I use books for the things I want to learn (S-3 student).*<br>*Since my computer use is limited, I do not do research (S-38 student).* | 2 | 5 |

In Table 2, students' views on using information technologies while conducting research for information purposes are evaluated. 57.5% of the students who participated in the research stated that they sometimes use information technologies while doing research for information purposes, 37.5% always use it and 5% never use it. Research findings reveal that the majority of students sometimes benefit from information technologies while doing research for information purposes.

In Table 3, students' views on using information technologies to do their school homework are given.

**Table 3:** *Students' views on using information technologies for school homework*

| **Categories** | **Participant Comments** | **Sum** F | % |
|---|---|---|---|
| | *While doing homework given by our teachers, I* | | |

| | | | |
|---|---|---|---|
| | *always do research on the internet (S-4 coded student).* | 9 | 22,5 |
| **I always prefer** | *I always use the internet to do the homework in our textbooks (28 code student).*<br>*If there is a place I do not know in homework, I always look on the internet (S-10 student).*<br>*Sometimes it is easier for me to find my homework on the internet (S-2 student).* | | |
| **I sometimes prefer** | *Sometimes I do my homework by looking at the supplementary books and sometimes by looking at the internet (S-5 student).*<br>*When my homework is difficult, I search online (S-14 student).*<br>*I can use the internet from time to time to get ideas while doing my homework (S-31 student).* | 26 | 65 |
| | *I do my homework with the help of books (S-7 coded student).* | 5 | 12,5 |
| **I never prefer** | *While doing homework, I look at what the teacher tells in the lesson (S-38 student).*<br>*I do not use a computer while doing homework (S-30 student).* | | |

In Table 3, the opinions of the students participating in the research on using information technologies for school homework were evaluated. 65% of the students stated that they sometimes use information technologies to do their school homework, 22.5% always use it and 12.5% never use it. Research findings reveal that the vast majority of students sometimes use information technologies to do their school homework. In Table 4, students' views on using information technologies for activity purposes are given.

**Table 4:** *Students' views on using information technologies for activity purposes*

| **Categories** | **Participant Comments** | **Sum** F | % |
|---|---|---|---|
| **I always prefer** | *I love computer games and play them all the time (S-6 student).*<br>*When I want to have fun, I always go online (Student S-9).*<br>*I love spending time on the Internet, and I log in every day (S-35 student).*<br>*I always go online to listen to music and play games (student code S-1).*<br>*Although not every day, I occasionally play computer games (S-27 student).* | 27 | 67,5 |
| **I sometimes prefer** | *Sometimes we play joint games with my friends on* | 12 | 30 |

| | | | |
|---|---|---|---|
| | *the computer (S-16 student).*<br>*Sometimes we watch movies. Sometimes I listen to music (S-40 student).* | | |
| **I never prefer** | *I don't have my own computer and my mom won't let me use her computer to play games (S-3 student).* | 1 | 2,5 |

In Table 4, the views of the students participating in the research on using information technologies for activity purposes were evaluated. 67.5% of the students stated that they always benefited from information technologies for activity purposes, 30% of them sometimes used it, and 2.5% of them never used it. Research findings reveal that the majority of students always benefit from information technologies for activity purposes.

## 4. Discussion

Research findings reveal that the majority of students sometimes benefit from information technologies while doing research for information purposes. In the study conducted by the Educational Technology Center of the Ministry of Education of Chile, in which the subject of information technologies in education and its use in schools were analyzed, in the scale of information technology use at school, the factor of the activities most frequently performed by students using information technologies was “productivity” (Hinostroza, Labbé, and Enlaces, 2005). They describe it as a “factor”. This factor; students' access to information, the use of educational software, the creation of presentations and document writing. In order, leisure time is followed by evaluation, communication, and communication with teachers. Özmusul (2010) studied the level of utilization of information technologies by primary school students. At the end of the study, while the students' level of use of information technologies was determined as medium level in the sub-dimensions of acquiring information, research-examination, communication, and game-entertainment in general, it was determined as low level for the sub-dimension of self-expression.

Research findings reveal that majority of students sometimes use information technologies to do their school homework. Tor and Erden (2004) evaluated the level of utilization of information technologies by primary school students in their study. As a result of the research, it has been determined that students use the computer mostly for connecting to the internet, chatting, writing, playing games, and studying. It is among the findings revealed as a result of the research that the rate of using the educational software of the courses is low.

Research findings reveal that majority of students always benefit from information technologies for activity purposes. In the study of Subrahmanyam, Kraut, Greenfield, and Gross (2000), it was stated that certain types of computer games have positive effects on various cognitive skills. In the same study, it was stated that although computer games create an important obstacle to computer literacy, they improve students' visual skills. It can be said that the level of students' use of information technologies while playing and having fun is related to the types of games and the way they have fun. From this point of view, in order to reach the potential benefits of information technologies to a large extent; It can be said that game types and entertainment styles that will contribute to the development of students, increase their cognitive skills, and improve their analysis skills should be preferred. Orhan and Akkoyunlu (2004) studied the internet use of primary school students in their

study. As a result of the research, it was determined that the majority of the students use the internet frequently, the rate of internet use increases as the ages of the students get older, and the rate of use for game purposes decreases as the age gets older. In addition, in the research, it was concluded that the goals of students such as accessing information and communication increase as the age increases.

## 5. Conclusion

Today, science and technology are constantly changing. The 21st century, which is called the information age we live in, has brought with it a period in which computer technologies develop rapidly and gradually become widespread in all layers of society. Information technologies, which have become widespread in the field of education in recent years, have a significant impact on the formation of students' information culture. In this study, the formation of students' knowledge culture through information technology was evaluated with student views. The results of the research reveals that students sometimes benefit from information technologies while doing research for information purposes and for doing their school homework.

At the same time, as a result of the research, it was determined that the students always benefited from information technologies for activity purposes. In line with these results, it is possible to say that the frequency of students' use of information technologies for activity purposes is higher than the frequency of use for homework and research purposes. It is thought that the dissemination of the use of information technologies, which are widely used by students in daily life, for education and training purposes, is one of the only duties of education systems that adopt the principle of raising students in accordance with the needs of the age.

## 6. Recommendations

The results obtained from the research reveal that education systems, teachers and parents have great duties in the effective use of information technologies by students. Education systems should be equipped with applications that increase the rate of students benefiting from information technologies in information acquisition and homework activities. While planning the course contents, a structure that encourages students to benefit from information technologies should be created.

Teachers should provide information about improvement and development by determining the students' ability to benefit from information technologies. Parents of students should be attentive to the provision of necessary equipment in order to enable students to benefit from information technologies. In addition, they should play an active role in providing the necessary time and motivation for students to benefit from information technology content appropriate for their developmental stages.

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