TEACHING COMPUTER SCIENCE WITHOUT COMPUTER

Teaching Computer Science in Afghan Secondary Schools

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ABSTRACT

Computers have become so significant in today’s world, most of the people use such kind of technology for different purposes in their life: such as computing, designing, calculation and so on. This kind of technology can help the teachers and students in learning process, or we can say that they can be used as a facilitator of the learning process.

This study circulates on how the teachers teach computer science in Afghan schools grade (10 to 12), although there are no computers in the classrooms and students just have textbooks for learning computer science. The teachers teach computer theoretically.

The study was conducted in 30 schools of six provinces of Afghanistan, the study was conducted based on quantitative research method using questionnaire for both teachers and students, because of security and some cultural problems just a few female teachers and students participated in the study and filling the questionnaires.

The study found that majority of teachers and more than half of the students believed that computer science is important in all parts of life; majority of the participants has no access to computers in their schools. Because of having no access to computers textbooks of CS are taught through lecture and group work methods. Additionally, teachers believed that textbooks of CS is useful but have some problems and students believed that these textbooks are so useful.

Finally, both teachers and students in this study have faced many problems in the field of CS, so MoE should undertake their problems and provide facilities such as computer labs, professional teachers and so on.
ACKNOWLEDGEMENTS

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ABBREVIATIONS

CS           Computer Science
CSTA       Computer Science Teachers Association
ICT       Information and Communication Technology
MoEM         Ministry of Education
MTCS       Methods of Teaching Computer Science
PWC       Price Waterhouse Cooper
TEMP     Teachers’ Educators Master Program
INTRODUCTION

Background
Education plays a vital role in the promotion of a nation. Or we can say that education has direct effect on development of a country. Without education, promotion and development is impossible.

However, in Afghanistan when a child becomes seven years old he or she starts elementary school for the first time, after elementary school he or she starts middle school and then high school. In Afghanistan a child must spend his or her six years in elementary school, three years in middle school and three years in high school (Ministry of Education, 2010). Some years ago there were no private schools in Afghanistan, but nowadays some private schools are opened in Kabul and some other provinces for the Afghan children. It is mentionable that there are also some religious schools in Afghanistan in which the children get Islamic knowledge. Those schools are called (Madrasas). This kind of education has an informal feature. Children start learning Islamic education in their mosques (masjids) from very beginner point; they start their learning from alphabet and then go to the upper level.

During the last three decades the education system in Afghanistan was not well promoted. According to the Constitution of 2003, Afghanistan has a compulsory basic education system. For the improvement of education system, Ministry of Education (MoE) planned to revise the curriculum and provide it according to the needs of students and regarding to modern technology. At that procedure MoE added a new subject (computer), but the question which arises is that how it will be taught? There are no professional teachers and also no computers in the classrooms. However, the MoE will establish a National Center of Science and Technology in all 34 provinces (Ministry of Education, 2010). But this is not the answer of that question.

Problem area
In today’s world, technology has considerably affected instruction through electronic and distance learning. These changes in education system have no long history, but started a few years ago and have promoted dramatically. Technology can provide facilities in instruction that years ago human could not think about. Some years ago technology in the classrooms was limited to the movies, television, and radio and so on. Today’s students use technology for different purposes such as: communication with each others at a long distance and to interact with a large knowledge bases and expert tutoring systems. Technology mostly considered as equipment such as; computers, but technology has a broad meaning. It is a problem for the researchers to find out the effects of technology on learner’s cognitive process during encoding, solving of problems and so on (Schunk, 2011).

Teachers often use computers for their personal and administrative purposes, and they have problems to use computers in their teaching. Computers are also used for tutorial and problem solving (Hattie, 2008).

Additionally, computer science has an important role on teaching other subjects. For example; technology has an important role in mathematics education. Different types of technology influenced culture of mathematics education considered as a complex of shared understanding about the pedagogy of mathematics. Up to now there is no unanimity about what is technology and how should be used in the classroom (Presmeg, 2007).
However, in Afghanistan usage of computers are not like in the developed countries. Computer sciences are taught by teachers in schools, but they teach it theoretically where learning computer skills needed to be taught practically. Some years ago Afghan schools had no computer science subject, but the Ministry of Education included this subject in new curriculum, the problem is that there are no computers in the classrooms the students have the textbooks of computer from grade 10 to 12. The textbook of grade 10 includes some topics like: introduction of computer and its different kinds, introduction of basic programs of computer, usage of computer for different purposes. The textbook of grade 11 points out some topics like: parts of computer, devises such as output and input devises, word program and so on. The textbook of grade 12 includes topics like: usage of computer in everyday life, excel program and some other office programs.

Finally, as mentioned before that learning computer is difficult theoretically, so this kind of technology should be taught practically, where in Afghan schools there are no computers still computer sciences is taught. It will be studied that how the teachers teach computer science without computers in Afghan schools (grade 10 to 12)

**Aim**
To identify and explore how computer sciences is taught in Afghan schools (grade 10 to 12).

**Research questions**
- How the teachers perceive the textbooks in Computer science implicated by Ministry of Education?
- Which methods do teachers use during teaching computer?
- What is the importance of learning computers according to students’ and teachers’ perspectives?
LITERATURE REVIEW

What is Computer Science?
Information and communication technology, “ICT is defined as the combination of informatics technology with other technology modalities” (Kargiban&Kaffash 2012 p. 1). At the teaching and learning process, the people are using ICT for the improving of learning and teaching process. Or we can say that technology is the facilitator of this process (ibid).

Computer science is a modern technology and a discipline that quickly developed and the computer science is “extremely short history has led to a diversity of opinions about its very substance” (Gal-Ezer&Harel, 1998, quoted by CSTA, 2005, p. 24). Some decades ago, people all over the world, did not understand about the computer, they did not understand how to use computer in their life they thought that computer is a tool for entertainment they use computer in their homes like a television, but in the 1980s the idea about the computer has got another meaning among the people or we can say that the people understood about use of computer. On that time the usage of computers was not so common among the people, or we can say that the people did not use the computer for their personal purposes. The feelings and thoughts of the people rapidly changed and they know computer as a science fiction. Microelectronic which is the technology of 1970s brought computers out of the laboratories and people familiarized with this kind of technology. In the field of education, computer paves the way for the good quality education to be improved. Beside that advantage of the computer, the learning of the computer’s usage considered as problem for the people, also the environment for the computing is another challenge for them (Sharma, 2002).

The Importance of Computer Science
In fact the using of technology becomes more significant in the classrooms. The use of technology in the classroom provides the way for the students to learn more and to operate in a new informative age. Moreover, in the traditional education system the learner cannot be more productive, or we can say that in traditional education environment the students remain behind to be productive in today’s society and the life will be so difficult for them in twenty-first century (Bingimlas, 2009). As we see that the development in ICT become the cause of remarkable changes in modern world, beside this, has some impact on the needs of new generation. Understanding the effects of new technology in every day’s life and place of work, the current educational institutions are trying to regenerate their educational initiatives and facilities in the classroom to reduce the teaching and learning technology gap between developed and developing countries. The restructuring of the institutions help the students in learning of a particular subject area, for the reason that to gain the useful learning for empowering the expert productivity (Amenyedziet al, 2011).

Using of computer technology has some advantages in teaching some subjects like physics and chemistry. Teachers use computer technology in their teaching, when they teach some complex topics in chemistry and physics. Or we can say that the teachers can easily teach complex topics through using computer technology. Students are also satisfied and the lecture becomes more interesting for them. Students like computer based work and spend more time in studying. They also use computer for other different purposes such as; calculation, solving problems and so on (Brekke&Hogstad, 2010).

In the recent years the researchers have found that in traditional classrooms, technology have positive effects on learning achievements, but this achievements belongs to some factors
such as; a wide teacher training and an obvious purpose (Fouts, 2000). There are also some other factors that are important for the achievement like; “Lower student to computer ratio; Teacher ownership of the reform efforts; Extensive teacher training and planning time; High levels of technological support” (ibid, p. 2).

**Access to Computer Technology in Some Developed and Developing Countries**
Beside the importance of computer, the availability of this kind of technology considered as an issue. Most of the developed countries have more access to the computer, than the developing countries. In 2002, 83 percent of American families had access to the computer in their houses (with at least one child aged 2–17) and the percentage of the children whose parents used internet in their homes were 78 (Moursund, 2005). The interesting and remarkable point is that the white students have more access to computer than the black students. Computer technology can be used for different purpose by students. They can use it for the completing their schoolwork such as editing their assignments, checking arithmetic and so on (Vigdor& Ladd, 2010).

In comparison, in that time Afghanistan faced with poor accessibility to computer technology. Ministry of Education (MoE) will provide a survey to find the schools that are needed to computer labs. MoE will also train the teacher to use the computer labs for all Islamic and general schools. Up to now MoE provide the text books for teaching computer (Ministry of Education, 2010).

**Using Computers in the Classrooms**
Teaching computer as a subject not only important for universities but also as significant in the primary, secondary and in high school as subject to be taught. We have witness that in today’s education system computer has the part as the subject in schools (Computing at School Working Group, 2012).

Americans teach computer in their schools as the subject of curriculum. The purpose of the teaching computer to eleventh class students is that to learn computer and to teach about computer in the future (Cuban, 2004). Students from wealthy families had more access to computer in schools than the students who belonged to poor families. White students also had more to computer in schools than black students. The native speaker of English language were using computer more than the students whose native language were not English (ibid, p. 2). While in Afghanistan most of students do not have access to computers. Therefore, ministry of education struggled to provide computer labs in all schools. Accordingly in 2008 ministry of education provided councils and these councils received and spend 11.5 million USD for providing computer labs and some other facilities of schools (Ministry of Education, 2010).

Additionally, the majority of the high school students in developing countries are not familiar with computing in their classrooms. Or we can say that most of the students do not have the experience of the computing. Most of the students do not know about the Computer Science major involvement. The common reasons for not choosing a CS major of both male and female students are that they have no wish to have access to the computers most of the time; actually they have chosen another major. Moreover, men were interested to use the computer for their entertainment such as; games and women were interested to use for other purposes (Carter, 2006).
The use of computer in the classroom interaction considered as a difficult task to be defined. The researchers found several definitions for computer use in the classroom interaction. They also found some components for the computer science interaction such as; frequency of use, amount of time used, and purpose (Blankenship, 1998).

One of the benefits of using ICTs in schools is to give the chance for the teachers to deliver their practices by preparing improved educational content and useful methods for the teaching and learning. ICTs also provide more interactive educational that have positive effects on student’s motivation and help the students at the finding of easy way of learning basic skills. The use some multimedia devices and computer applications are the cause of more challenges and engaging learning environments for all students in all ages (PWC, 2010).

Methods of teaching computer science
Educational research studies and articles found that professional teachers should have more knowledge and experiences. Beside the knowledge and experience, the teachers should have the ability of designing the lesson and the learning process. The teacher should have the ability of the planning and delivering the units of tutoring. It is also important for the teacher to have the ability of assessment and evaluating the lesson. These are the four steps that essential for the MTCS methods of teaching computer science (Lapidot&Hazzan, 2003).

“Having activities away from computers is effective because children generally know the computer as a tool or toy, rather than the subject of study in itself” (Bellet al, 2008, p.128). When the children do not have computer they will think about the challenges that computer scientists faced beyond the simple programming. Some topics such as algorithm complexity, data compression, graphics algorithms, interface design and models of computing considered as confront in the case of not having technical experiences. At time of teaching computer science to the children, when the children find some more interesting topics, they pay their attention to that instead of following the arranged topics in their subject of computer science (ibid).

In modern system of education and everyday life of the students computer science has an important role, and it become more significant in several parts of the life. Beside the importance of computer science the teachers of CS have faced some challenges. For example; teachers are most of the time poorly prepared to teach computer, because they do not have the full knowledge of computer’s skills. For the teachers who have not acquired full knowledge of computer’s skills it is important to consider themselves in the position of the learner. It means it is necessary to learn these skills; knowing of the teacher will help the students to solve the problems that they faced with. Another challenge that the teachers faced with that the hardware and software programs of the computer are so complex, and the unfamiliarity of the teachers is problem during the teaching. The third challenge is with the low level students, the teachers cannot teach them computer skills, or we can say that the teacher cannot transfer the knowledge of computer skills to the students easily (Corbel & Gruba, 2004).

It is mentionable that students of different levels need different computer skills. Low level students need to learn some basics of the computer such as; usage of the mouse and keyboard, they must learn how to open and close the programs, they should familiarize with some basic commands and menus, they should be able to save, copy, print and open files. In intermediate level, the students need to know, how to recognize the files types and how to open them, they need to know the advanced word-processing skills, they need to handle the audio and multimedia files, they should know web search, they must understand how to solve some basic
problems of computer and printer, they should be able to transfer common programs to each other (ibid).
METHODS

This study mainly circulates on teaching computer science in high schools (grade 10 to 12) in Afghanistan, also the ideas of the teachers and students about the teaching and learning strategies. This research is conducted based on qualitative research methods. Quantitative research is useful for collecting numerical data through questionnaires and other types of tools. Moreover, it focuses on the quantification in collection of the data and its analysis (Bell, 2010; Bryman, 2012). On the one hand I wanted collected numerical data so I choose quantitative method for my study. On the other hand I had limited time for collection of the data, so I use this kind of strategy. Quantitative methods through the questionnaire pave the way to collect a lot of information from the participants in a short period of time (Bryman 2012). This study was conducted in six neighboring provinces of Afghanistan, so the questionnaires helped me to collect the data for the study easily and in a short time. The second reason for selecting the questionnaires was that the participants have enough time and they can fill them comfortably (Cohen et al, 2010).

It is mentionable that I put some open ended questions in both questionnaires that give the opportunity to the participants to express their ideas and opinions in their own words (Denscombe, 2010). Both questionnaires provided based on literature review and research questions. I put 24 questions in teachers’ questionnaire and 20 questions in students’ questionnaire. I also asked the teachers about the age, experience, sex, education level etc… in their questionnaires. The questionnaires had three sections; in the first section factual questions, in the second section closed question and in the third section the open ended questions are placed.

The study was conducted from 25 September 2013. I collected the data in 15 days. In the process of data collection teachers of both sexes (male and female) and students of grade 10 to 12 were selected. It is mentionable that three of my colleagues helped me in distribution and collection of the questionnaires. I distributed an authorized letter of permission for the school’s formal teachers. Teachers and students were asked to fill the questionnaires honestly. I have collected and analyzed the information. I used coding system in some open ended questions and I choose the information related my research questions and literature review and displayed the information in tables and texts.

However, I analyzed the collected data in different steps; first of all I compiled and presented it, means I found its frequency, average, mode and relative frequency. Secondly, I separated the questions related to research questions. I have chosen the questions which are shown important differences regarding different research questions. In addition, I ignored the questions which are revealed general and similar evidences. There were some questions which none answered. These questions were not important, therefore not remarked.

Participant and Location

The research participants were teachers who teach computer Science in high schools (grade 10 to 12) and students of mentioned grades. I have tried to distribute the questionnaires in both rural and urban areas, so I selected 20 teachers and 35 students in rural areas and 10 teachers and 25 students in urban areas. The study is conducted at 30 schools in six provinces of Afghanistan (Kunar, Ningarhar, Laghman, Khost, Paktia and Paktika) 5 schools per province and one teacher and 5 students per school were selected. The selection of teachers was based on their profession or they were teachers who taught computer science in schools and students were randomly selected. Due to some cultural and security problem, less number of female students and teachers participated in this study. The reason for the selection of these six provinces is the accessibility
to me. I have prepared sixty questionnaires for the students and thirty for the teachers. Participants include both male and female in each province. The following table shows the number of the participants in each province.

Table 1: Total numbers of the participants who answered the questions

<table>
<thead>
<tr>
<th>NO</th>
<th>Province</th>
<th>Teachers</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>1</td>
<td>Kunar</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Laghman</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Ningarhar</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Khost</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Paktia</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Paktika</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>23</td>
<td>7</td>
</tr>
</tbody>
</table>

Limitations

Research is a difficult process and most of the researchers faced with so many problems, I have also faced some problems during my research, and I will point out some of the problems. One of the problems was that the teachers and students did not answer some of the questions in the questionnaires. For example; in multiple choice questions the last alternative was (any other idea?), more participant did not answer that alternative the reason might be that they are agree with one of rest alternatives of the questions. However; it is not a big issue and will not affect on the result of the study, because there are more responses to help the result of the study. Students participants did respond one of the questions that was about their suggestions to their teachers. Maybe they were satisfied their teachers’ teaching and they had no suggestions to the teachers. It does not have any negative effect on the study, because rest of the responses are sufficient for answering the research questions and for completing the study. Security problem was another big challenge against my data collection; most of the schools were in unsecure areas in some provinces such as Kunar, Lghman, Khost, Paktia and so on, where collection of the data was really important for me. It is mentionable that there is no other research on teaching Computer Science in Afghanistan yet, and that could be considered as a big problem against my study, so I will compare this study with research from some developing and developed countries.

Ethical problems

Researcher should explain the purpose of the research to the participant, because in some cases the researcher may face some problems. Such problems are the participants may ask:

- What will be advantages or disadvantages of the research for me or for the school?
- Do the questions have any responsibility in the future?
- Am I having the permission from administration of the school to respond the questions?

To avoid such kinds of questions the researcher should clearly explain and introduce his or her research and its effects. However; the participants also have the rights to say that he or she do not want to answer the questions (Bryman, 2012). During distribution of the questionnaires I clearly explain the purpose of the study to the participants to whom I myself distributed the questionnaires. I also explained it to my colleagues who helped me in collection and distribution.
of the questionnaires and they explained the purpose to the participants. Fortunately, my colleagues were my classmates in TEMP, so they had the ability to explain the aim of the study clearly to the participants.
FININGS
In this chapter, the opinions of the teachers and students of both sexes (male and female) are collected from the questionnaires and analyzed. It is mentionable that the data of female and male teachers and students are separately analyzed.

Teachers’ and Students’ Perspectives on Importance of CS
People of the world have different ideas about the importance of Computer Science. In Afghan schools students and teachers newly familiarized with that kind of technology, so it will be important to know about the students and teachers ideas about the importance of CS.

Table 2: Male and Female Teachers’ and Students’ Opinions

<table>
<thead>
<tr>
<th>4. What do you think about the importance of computer science?</th>
<th>Male Teachers</th>
<th>Female Teachers</th>
<th>Total</th>
<th>Male Students</th>
<th>Female students</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Computer Science is important in every part of the life.</td>
<td>17</td>
<td>74%</td>
<td>6</td>
<td>86%</td>
<td>23</td>
<td>77%</td>
<td>27</td>
</tr>
<tr>
<td>Computer Science is important just for the school students.</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>5</td>
</tr>
<tr>
<td>Computer Science is important for teachers.</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Computer Science is important for both teachers and students.</td>
<td>6</td>
<td>26%</td>
<td>1</td>
<td>14%</td>
<td>7</td>
<td>23%</td>
<td>1</td>
</tr>
<tr>
<td>All above</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100%</td>
<td>7</td>
<td>100%</td>
<td>30</td>
<td>100%</td>
<td>41</td>
</tr>
</tbody>
</table>

Participants of the research had similar ideas and opinions about the importance of CS. As the table above shows that (77%) teachers specifically (74%) male teachers and (86%) female teachers believe that CS is important in every part of life. On the other hand (66%) of male students and (63%) female students the total percentage of which becomes (65%) agreed with that opinion.

Methods of Teaching CS in Afghan Schools
Different subjects need different methods of teaching. In Afghan schools Computer Science is taught by teachers, teachers use different methods and have different ideas about methods of teaching CS. The following tables show teachers’ and students’ opinions about methods of teaching CS.
Table 3: Methods that are used by Teachers

<table>
<thead>
<tr>
<th>Which of the following teaching methods do you use for teaching CS?</th>
<th>Male Teacher</th>
<th>Female Teacher</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Group work</td>
<td>8</td>
<td>35%</td>
<td>1</td>
</tr>
<tr>
<td>Lecture</td>
<td>8</td>
<td>35%</td>
<td>6</td>
</tr>
<tr>
<td>Answer and question</td>
<td>7</td>
<td>30%</td>
<td>0</td>
</tr>
<tr>
<td>Competitive</td>
<td>0</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Lecture and answer and question</td>
<td>0</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>any other method</td>
<td>0</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100%</td>
<td>7</td>
</tr>
</tbody>
</table>

(47%) of the teachers in afghan schools use lecture method for teaching CS. This table also shows that separately (86%) female teachers use lecture method where (35%) of male teachers use this method and the same percentage of them use the group work method.

Table 4: Useful Methods, According to the Teachers’ Opinions

<table>
<thead>
<tr>
<th>Which method more useful for teaching CS?</th>
<th>Male teacher</th>
<th>Female teacher</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Group work</td>
<td>11</td>
<td>48%</td>
<td>4</td>
</tr>
<tr>
<td>Lecture</td>
<td>5</td>
<td>22%</td>
<td>1</td>
</tr>
<tr>
<td>Answer and question</td>
<td>7</td>
<td>30%</td>
<td>2</td>
</tr>
<tr>
<td>Competitive</td>
<td>0</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>any other method</td>
<td>0</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100%</td>
<td>7</td>
</tr>
</tbody>
</table>

According to the table (48%) male and (57%) female teachers totally (50%) of the teachers believe that group work method is more useful for teaching CS.

Table 5: Students’ Opinions about the Methods Used by Their Teachers

<table>
<thead>
<tr>
<th>11. Your teachers use useful methods for teaching Computer Science.</th>
<th>Male Students</th>
<th>Female Students</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>7</td>
<td>17%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Agree</td>
<td>28</td>
<td>68%</td>
<td>18</td>
<td>95%</td>
</tr>
<tr>
<td>I don’t know</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Disagree</td>
<td>6</td>
<td>15%</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>
Students have different ideas about the usefulness of teaching methods used by their teachers for teaching CS. The above table shows that (68%) male and (95%) female students totally (77%) students agreed that their teachers use useful methods for teaching CS.

As expressed by the respondents’ teachers, teachers mostly use the lecture method during teaching CS (Table 3); lecture method is teacher-center method, where most of them believe that group work method is more useful for teaching CS (see table 4 above). This means that at least they are aware of teaching methods i.e. group work but do not apply in classrooms.

**Textbooks of CS According to the Teachers and Students Perspectives**

Ministry of Education implicated some textbooks for teaching computer science. The teachers in Afghan schools teach with textbook in the classrooms and they have some opinions about these textbooks. The following tables show different ideas of the teachers and students about these textbooks.

**Table 6: Teachers’ Opinions about the Textbooks**

<table>
<thead>
<tr>
<th>7. What is your opinion about the textbooks of CS that implicated by MoE? Are they?</th>
<th>Male Teachers</th>
<th>Female Teachers</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>Useful for teaching CS.</td>
<td>6</td>
<td>26%</td>
<td>2</td>
<td>29%</td>
</tr>
<tr>
<td>Not useful for teaching CS.</td>
<td>3</td>
<td>13%</td>
<td>1</td>
<td>14%</td>
</tr>
<tr>
<td>Useful, but have some problems.</td>
<td>12</td>
<td>52%</td>
<td>4</td>
<td>57%</td>
</tr>
<tr>
<td>More useful</td>
<td>1</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Any other idea:</td>
<td>1</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100%</td>
<td>7</td>
<td>100%</td>
</tr>
</tbody>
</table>

The above table shows that (52%) male and (57%) female teachers totally (53%) teachers believe that the textbooks that are implicated by MoE is useful for teaching CS, but have some problems.

**Table 7: Students’ Opinions about the textbooks**

<table>
<thead>
<tr>
<th>7. What is your opinion about the textbooks of CS that implicated by MoE? Are they?</th>
<th>Male Students</th>
<th>Female Students</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>They are so useful for the students</td>
<td>13</td>
<td>29%</td>
<td>8</td>
<td>40%</td>
</tr>
<tr>
<td>Students cannot learn anything from them.</td>
<td>7</td>
<td>16%</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>They are useful, but just for learning some definitions and introduction of some programs of computer.</td>
<td>11</td>
<td>24%</td>
<td>3</td>
<td>15%</td>
</tr>
<tr>
<td>They are useful, just for 10th class students because they start learning computer for the first time.</td>
<td>5</td>
<td>11%</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>
Students have many ideas and opinions about the textbooks, but a large percent of the students according to the table above are believe that these books are so useful for the students. The high percentage on this opinion are (29%) male students, (40%) female students and totally (32%) of both male and female students. In comparison, the above tables show that most of the teachers believe that textbooks are useful for teaching CS, but have some problems. On the other side majority of Participants’ students believe that they are useful textbooks for them.

Problems of Teachers and Students in relation to CS
Afghan teachers and students have problems in their education system, because of these problems they did not promote well in education. Beside other problems Afghan teachers have some problems in teaching CS and student in learning CS. The following tables that are made on questionnaires show the problems of the teachers and students in percentage. It is mentionable that these problems are analyzed separately based on gender (male and female) and based on region or area (rural and urban).

Table 8: Teachers’ Related Problems Based on Gender

<table>
<thead>
<tr>
<th>15. What is the most remarkable problem when you teach Computer Science?</th>
<th>Male Teachers</th>
<th>Female Teachers</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>Students have no access to computers.</td>
<td>2</td>
<td>8%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Teachers have no access to computers.</td>
<td>2</td>
<td>8%</td>
<td>1</td>
<td>13%</td>
</tr>
<tr>
<td>Both teachers and students have no access to computers</td>
<td>20</td>
<td>83%</td>
<td>7</td>
<td>88%</td>
</tr>
<tr>
<td>Both have access to computers, but there is no electricity.</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>We do not have professional knowledge for teaching computer science.</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Any other problem; write it down</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24</strong></td>
<td><strong>100%</strong></td>
<td><strong>8</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

No accessibility to computer technology considered as big problem in Afghan schools. Most of the teachers and students have no access to computers, so they cannot teach computer science easily. In the above table shown that (84%) of teachers are say they and their students have no access to computer. In this case (No accessibility to computer) the percentage of female teachers (88%) is high than the percentage of male teachers (83%).
### Table 9: Teachers’ Related Problems Based on Region

<table>
<thead>
<tr>
<th>15. What is the most remarkable problem when you teach Computer Science?</th>
<th>Rural Teachers</th>
<th>Urban Teachers</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students have no access to computers.</td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Teachers have no access to computers.</td>
<td>2</td>
<td>8%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Both teachers and students have no access to computers</td>
<td>2</td>
<td>8%</td>
<td>1</td>
<td>14%</td>
</tr>
<tr>
<td>Both have access to computers, but there is no electricity.</td>
<td>21</td>
<td>84%</td>
<td>6</td>
<td>86%</td>
</tr>
<tr>
<td>We do not have professional knowledge for teaching computer science.</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Any other problem; write it down</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25</td>
<td>100%</td>
<td>7</td>
<td>100%</td>
</tr>
</tbody>
</table>

The above table show that (84%) rural and (86%) urban teachers claim that the big problem of them and of their students is no access to computers; thus, there was no difference between rural and urban teachers.

### Table 10: Students’ Related Problems Based on Gender

<table>
<thead>
<tr>
<th>16. What is your remarkable problem during learning computer science?</th>
<th>Male Students</th>
<th>Female Students</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>We do not have professional teachers.</td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>No access to computer</td>
<td>22</td>
<td>28%</td>
<td>9</td>
<td>25%</td>
</tr>
<tr>
<td>We can learn computer theoretically</td>
<td>34</td>
<td>43%</td>
<td>15</td>
<td>42%</td>
</tr>
<tr>
<td>Limited periods per week for learning computer skills</td>
<td>23</td>
<td>29%</td>
<td>10</td>
<td>28%</td>
</tr>
<tr>
<td>Any other problem; write it down</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>79</td>
<td>100%</td>
<td>36</td>
<td>100%</td>
</tr>
</tbody>
</table>

No access to computers is not only the problems of the teachers during their teaching, but also considered as a problem for the students during learning CS. (43%) of the male students and (42%) of the female students claim that they do not have computers in their classrooms. Besides not having computers (27%) male and female students are says that they have no professional teachers for teaching CS.

### Table 11: Students’ Related Problems Based on Region

<table>
<thead>
<tr>
<th>16. What is your remarkable problem during learning computer science?</th>
<th>Urban Students</th>
<th>Rural Students</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
</tbody>
</table>

14
We do not have professional teachers.  

<table>
<thead>
<tr>
<th></th>
<th>Male Teachers</th>
<th>Female Teachers</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>We do not have professional teachers.</td>
<td>9</td>
<td>22</td>
<td>31</td>
<td>27%</td>
</tr>
<tr>
<td>No access to computer</td>
<td>20</td>
<td>29</td>
<td>49</td>
<td>43%</td>
</tr>
<tr>
<td>We can learn computer theoretically.</td>
<td>13</td>
<td>20</td>
<td>33</td>
<td>29%</td>
</tr>
<tr>
<td>Limited periods per week for learning computer skills.</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Any other problem; write it down</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>43</strong></td>
<td><strong>72</strong></td>
<td><strong>115</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The above table shows that (47%) urban students and (40%) rural students say that they do not have computers in their classrooms, they considered that as big problem in learning CS. Additionally, in urban area (30%) students learn computer theoretically, where in rural area (31%) students claim that they do not have professional teachers. These are the problems of the students in rural and urban areas against learning CS.

According to above tables all the participants have almost the same problems. The big problem of the participants in rural and urban area; male and female are having no access to computers. The second problem that some of the students faced with that are the lack of professional teachers.

Suggestions of Afghan Teachers and Students to MoE

As in the above tables shown that Afghan teachers and students have some problems in teaching and CS. Solving of these problems is the responsibility of the ministry of education, there for I put some questions in teachers and students questionnaires for collection of teachers and students suggestions to the MoE. I analyzed them in two separate tables based on gender.

Table 12: Teachers’ Suggestions to MoE

<table>
<thead>
<tr>
<th>24. What is your suggestion to the Ministry of Education (MoE) or government for better teaching and learning Computer Science in the future?</th>
<th>Male Teachers</th>
<th>Female Teachers</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>MoE should provide computer labs in schools</td>
<td>9</td>
<td>39%</td>
<td>2</td>
<td>29%</td>
</tr>
<tr>
<td>Government should provide us computers in classrooms</td>
<td>1</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>MoE should provide us training programs</td>
<td>4</td>
<td>17%</td>
<td>3</td>
<td>43%</td>
</tr>
<tr>
<td>MoE should provide professional teachers</td>
<td>1</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>MoE should provide us electricity in the school.</td>
<td>8</td>
<td>35%</td>
<td>2</td>
<td>29%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>23</strong></td>
<td><strong>100%</strong></td>
<td><strong>7</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The table shows that (39%) male and (29%) female teachers totally (37%) teachers have suggestions to MoE to provide them computer labs in their schools. On the other hand, (43%) female teachers want training programs, beside computer labs in their schools.
Table 13: Students’ Suggestions to MoE

<table>
<thead>
<tr>
<th>20. What is your suggestion to the Ministry of Education, for solving your problems? Write it here:</th>
<th>Male Students</th>
<th>Female Students</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#%</td>
<td>#%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My suggestion to MoE is to provide computers for us and to train professional teachers</td>
<td>24 59%</td>
<td>13 68%</td>
<td>37</td>
<td>62%</td>
</tr>
<tr>
<td>No suggestion</td>
<td>6 15%</td>
<td>6 32%</td>
<td>12</td>
<td>20%</td>
</tr>
<tr>
<td>My suggestion is to provide computers for us</td>
<td>9 22%</td>
<td>0 0%</td>
<td>9</td>
<td>15%</td>
</tr>
<tr>
<td>My suggestion to MoE is to provide computers, electricity professional teachers for us</td>
<td>1 2%</td>
<td>0 0%</td>
<td>1 2%</td>
<td></td>
</tr>
<tr>
<td>My suggestion is to provide us professional teachers</td>
<td>1 2%</td>
<td>0 0%</td>
<td>1 2%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>41 100%</strong></td>
<td><strong>19 100%</strong></td>
<td><strong>60</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Beside the teachers Afghan students also have some suggestions to MoE. The table above shows that (59%) male and (68%) female students suggested that the MoE should provide them computers and should train professional teachers for them. As above tables shows that majority of the participants suggested to MoE to provide them computer labs and professional teachers.

Finally, the participants of the study consider that CS is important in their life. The teachers and students have no access to computers the teachers just teach textbooks of CS through lecture and group work methods. Additionally, teachers and students have some problems in teaching and learning CS, the big problem of them is no access to computers in their schools that can have negative effect on learning process.
DISCUSSION

About the importance of CS
Although teachers and students have no access to computers, but they can understand the importance of CS. Majority of teachers and students believed that CS is important in all part of the life, while few of them believe that CS important for just for school students. Bingimlas (2009) also expressed that currently life is so difficult without CS technology. Computer Science as a tool of ICT is used in education for different purposes such as communication between learners of long distance; for making and delivering of presentations and lectures; for sharing contents and so on (Baha & Diakoumi, 2010).

Afghan teachers and students face with so many problems in their everyday life in the lack of computer technology, so they traced the necessity and importance of this kind of technology.

More usable methods for teaching CS in Afghan schools
The study also found that most of the teachers in this study use lecture method and group work method during teaching CS. In the studied schools 47 percent of both sexes (male and female) use lecture method. It is mentionable, that female teachers use lecture method more than male teachers, or we can say that 86 percent of female teachers use lecture method, where 35 percent of male teachers use this kind of method. The reason of more using lecture method might be that due to some cultural problems female teachers (specifically of rural areas) do not participate in workshops and seminars that conducted by MoE for improving teaching skills. For example; they cannot go to the workshops without mhram (brother, father, husband, son…), so they cannot learn methods of teaching. Moreover, teacher’s methods have direct effect on students’ learning, if their teachers use useful methods the students will be benefited and will learn more. On the other side, if the teachers use method that is not helpful in students’ learning such as lecture method, the students learning will be badly affected and they will not learn better. The remarkable point in this finding is that the percentages of male teachers who use group work method and who use the lecture method are the same and it is 35 percent. Lecture method is a method in which the teacher more actively participated than students and it belongs to behaviorism. Behaviorism is a theory of learning according to which the teacher acts as an active participant and student just hear to what the teacher says (Yilmaz, 2011). Students can easily learn CS through discussion with each other or with their teacher in classrooms (Carbone & Kaasboll, 1998). Another good way of learning CS is group work in their classrooms; in group work students are practicing and sharing ideas with each other (ibid). In Group work method students more actively participated in learning process such as in constructivism theory of learning. Constructivism is a theory of learning in which student more actively participate than teacher, or it is a student-center theory of learning (Boghossian, 2006). Teachers in Afghan schools do not know about constructivism or behaviorism, but the methods that they use in their teaching are the same as these kinds of theories. For example; lecture method is a teacher-center method like behaviorism and group work method is a sudden-center method like constructivism theory of learning.

The study also found the useful methods according to the teachers’ opinions. 50 percent of Afghan teachers say that the most useful method for teaching CS is group work method. The
question will be found that why most of the teachers use lecture method where it is an old method of teaching. The answer for this question is that a large number of the students in one class are studying, so it hard to apply the student-center teaching methods. Overpopulated classes are the problem of most developing countries such as Afghanistan (Osin, 1998).

Most of the students satisfied their teachers’ methods 95 percent of the female students are agreed that their teachers use useful methods, where 68 percent of male students show their satisfactions from their teachers’ methods. Female students will be disadvantaged if their teachers use lecture method. For example: on the one hand they will not learn better from the lectures of their teachers, because in lecture method the students just learn what the teacher says (as mentioned above). On the other hand, female students will be taught that there is no any other method for teaching without lecture method and they will be taught that as a good method for teaching.

A point that must be mentioned is that most of the teachers in Afghan schools believe that the useful method for teaching CS is group work method, but they use lecture method in their teaching. Teachers cannot apply group work method in the classrooms; it is a student-centered method, in Afghan schools about 50 or more than that are studying in one class. It is difficult for a teacher to apply all the process of group work method in such kind’s classes. The students are not familiar with other teaching methods, because their teachers did not use them in the classrooms, so they think that they are useful methods for teaching CS. Finally, teachers understand about the useful methods, but cannot apply them because of some problems. Or they may be aware that this is good method, but they do not have information about how to apply this method.

Moreover, in Afghan schools most of the students have faced with the lack of professional teachers, where professional teachers can easily solve the students’ problems during teaching. Or they can easily deliver knowledge to the learners. Professional teachers also have better knowledge about teaching methods, and they have more ability of applying such kinds of methods than nonprofessional teachers. Finally, it is not important to know just about the significance or importance of teaching methods for the teachers, but important thing is that to know how apply and how to use the useful methods practically, during teaching.

**Textbooks for teaching CS**

Another major finding of the study is the teachers’ and students’ opinions about the textbooks that are implicated by MoE. A little more than half of the teachers (53%) believe that these books are useful for teaching CS, but have some problems. 32 percent of students, including 40 percent female and 29 percent male students, believe that the textbooks are useful for the students. It is the fact that CS cannot be learnt without computers, and the textbooks just introduce some basics of CS theoretically. As mentioned in the problem area textbooks are mainly circulated on the introduction of computer, usages of computer in everyday life and some more basic programs of computer, where these topics cannot cover all needed knowledge of the students about the CS. CS can be used for several purposes such as tutorial, problem solving designing and so on (Hattie, 2008). In the case students do not learn intermediate and advanced skills of CS, they will face so many problems in their future life.
Problems in teaching and learning CS in Afghan schools

Another major finding of the study is problems of teaching computer science in Afghan schools. The major problems of Afghan teachers and students in teaching and learning CS is no access to computers, lack of professional teachers for teaching CS and some other problem. It should be mentioned that the problems of male and female teachers and students are a little bit different from each other. Also the urban teachers and students; and rural teachers and students have different problems. Having no access to computer is problem of both teachers and students. The study found that 84 percent teachers have no access to computers in their classrooms, the majority of this percentage are female teachers the percentage of them is 88 percent, where the percentage of male teachers are 83 percent.

On the other side 84 percent urban teachers and students and 86 percent of the rural teachers and students have no access to computers in their classrooms. In comparison, with some developed countries such as United States of America; 83 percent of American families had access to computers in their houses (Moursund, 2005). But in Afghanistan almost the same percentage of teachers and students have no access to computers in their classrooms currently.

Beside no access to computers of the male and female students in rural and urban areas, lack of professional teachers is also a problem for the students during learning CS. It is mentionable that 28 percent male students and 25 percent female students, also 21 percent urban and 31 percent rural students faced that problem. Additionally lack of professional teachers is not only the problem of developing countries such as Afghanistan, but also some developed countries such as Israel has the same problem (Osin, 1998).

However, solving such kinds of the problems is the responsibility of MoE which should solve them. Otherwise the students will face more problems than that in their future life and life will become so difficult for them in twenty first century (Bingimlas, 2009).

Suggestions to MoE

The study also found that some teachers and students have suggestions to MoE, for solving their problems and for better teaching and learning of CS. It is mentionable that the problems male and female teachers and students are different from each other. As mentioned in above section, most of teachers and students have no access to computers, so 39 percent of male teachers suggested that the MoE should provide them computer labs in their schools. This is not only the suggestion of male teachers, but also 29 percent of female teachers have the same suggestion. Beside this most of the female teachers have another suggestion also, 43 percent of female want computer labs and training programs in their schools from this finding we clearly understand that female teachers have more problems during teaching CS than male teachers or maybe they response questions of the questionnaires more honestly than male teachers.

The students also asked about their suggestions to MoE in this study and found that 59 percent of male students and 68 percent female students totally 62 percent students have suggestions to MoE to provide them computers and to train professional teachers for them. Lack of professional teachers and no computers are serious problems for student in afghan schools. These problems will be solved soon because Ministry of Education (MoE) will provide computers in schools and will train the teachers for using the labs in Afghan schools (Ministry of Education, 2010). It is clear that teaching and learning of CS are impossible or so difficult, without computers or computer labs. Learning and teaching CS needs practical work and
practical work needs computers. The students will learn better and teacher will teach better, if the MoE provide them such kind of technology.

Afghanistan is a developing country that witnesses of three decades war this war affects all parts particularly education system. However, this country needs more promotion in its education system, where today’s education system mostly focuses on new technology. To understand the usage of new technologies, it is important for the learners to get more knowledge of CS. It is responsibility of MoE to solve all the educational problems including problems that related to CS.

Moreover, this study can help MoE in the field of CS. As the MoE have the plan to find out the schools needs computer labs in all the country (Ministry of Education, 2010). This kind of studies will help MoE in finding the teachers’ and students’ problems regarding CS. Additionally, before solving a problem it is necessary to find that problem, or we can say that a problem should be found and then should be solved. This study shows the problems of teaching and learning CS, so MoE should pay attention to solving of these problems. If the MoE undertakes this study and the same studies like this and start for solving of the problems that found through this study, more problems of the teachers and students will be solved as soon as possible.

In Afghan schools most of the teachers use lecture methods in their teaching, where nowadays new and modern teaching methods used by the teachers in other countries. The study also can help the MoE to aware of the teaching methods of Afghan schools’ teachers. MoE should continue training programs and workshops for the teachers regarding new and useful methods.

Finally, education system play a vital role in promotion of a country, and good education system belongs to modern technology. Modern technologies can bring more facilities in education system. It is also important to find out the needs for new technologies; an easier way of findings such kinds of needs are the studies like this. All the educated people should pay their attention to conduct studies on different parts of education system particularly, in new technologies. These studies will play a good role in findings and solving the problems that Afghan teachers and students have in their education system.
CONCLUSION

The aim of the study was to find how the teachers teach Computer Science in Afghan schools grade (10 to 12). The study found that most of the Afghan teachers and students have no access to computers in their schools, so the teachers have problems in teaching CS and student have problems in learning of it. The study found that most of female and male had almost the problems in teaching CS. The teachers in Afghan schools use lecture and group work methods during their teaching. There are no any other facilities for teaching and learning CS without textbooks.

To a large extent this study contributed to existing knowledge in the area related to the literature review. The study had three research questions, all the questions responded and the responses collected, analyzed and discussed during different process of the study. First of all the study found that most of teachers believed that the textbooks that are implicated by MoE are useful for teaching CS, but have some problems, also the students considered that these books are useful for them. Secondly, most of the teachers use lecture and group work methods for teaching CS. Finally, most of teachers and students of both sexes (male and female) believed that CS is important in all parts of the life.

The study also found that most of the students and teachers have problems in teaching and learning CS. In Afghan schools, most of the teachers and students faced with the lack of computers in their classrooms. The second major problem that mostly students are faced with that is lack of the professional teachers, but the female students and the students of the rural areas faced with that problem more than the other students.

The students and teachers have some suggestions to MoE, most of suggestions were about the providing of computer labs in schools and professional teachers. These two things have really important role in teaching CS.

Finally, this study conducted on teaching CS in Afghan schools, where there are no computers. Technology in the modern world is promoting day by day and only computer cannot represent all the technologies, so other technologies also should be used in education system. For the future, it will be useful to conduct such kinds of studies regarding the new and modern technologies.
REFERENCES


ANNEXES

Annex. 1. Teachers’ Questionnaire

Age: ..................... years
Male □ Female □

Education:  (Please select one option based on your level of education)
Grade 12 □ Teacher Training College □ University □ Other specify.............
Islamic education....................... years

Teaching Experience .............. years

Teaching Subject:
Social Science □ Computer Science □ Physics □ Chemistry & Biology □
Mathematics □ Islamic Subjects □ If you teach any other subject (s) please write it down here: ...............................................................

Teaching Class: Boys □ Girls □ Mixed □
Teaching Level: 1 to 6th □ 7 to 9th □ 10 to 12th □

Questions

Note: For the multiple choice questions you can use more than one option.

1. What is ICT information and communication technology? (you can choose more than one option)
   a) ICT is the facilitator of the new system of education.
   b) ICT is an invention of the new world.
   c) ICT is a helpful technology in the field of teaching.
   d) ICT pave the way for the students to contact each other for solving their educational problems.
   e) ICT helps the students to solve their complex issues.
   f) Any other idea:

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2. What do you think about the importance of computer science?
   a) Computer Science is important in every part of the life.
   b) Computer Science is important just for the school students.
   c) Computer Science is important for teachers.
   d) Computer Science is important for both teachers and students.
   e) Any other idea:

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3. Teaching Computer Science is important for all grades in school?

4. Strongly agree □  b) agree □  c) I don’t know □  d) disagree □  e) strongly disagree □

5. What do you think, in which level is most important?
   a) Grade 1-6  b) Grade 7-9  c) Grade 10-12  d) All above

6. Learning Computer Science has advantages for the students.

7. Strongly agree □  b) agree □  c) I don’t know □  d) disagree □  e) strongly disagree □

8. What are the advantages of Computer Science for school students (grade 10-12)?
   a) They will become familiar with new technology.
   b) They will understand how to use computers in the classroom.
   c) They will learn some basic programs of computer.
   d) They will get some information about the importance of computer
   e) Any other idea; write it down

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9. What is your opinion about the textbooks of CS that implicated by MoE? Are they?
   a) Useful for teaching CS.
   b) Not useful for teaching CS.
   c) Useful, but have some problems.
   d) More useful.
10. CS textbooks can be taught the same like other textbooks.
   a) Strongly agree □  b) agree □  c) I don’t know □  d) disagree □  e) strongly disagree □

11. Are you satisfied from teaching these textbooks?
   a) Yes □  No □

12. If no what is the reason? Please write it down:
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13. Which level of computer skills do you teach in the school?
   a) Basic skills  b) Intermediate skills  c) advanced skills

14. Which of the following teaching methods do you use for teaching computer science?
   a) Group work  b) Lecture  c) Answer and question  d) Competitive method
   Any other method; please write it down.
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15. Which method more useful for teaching Computer Science?
   a) Group work  b) Lecture  c) Answer and question  d) Competitive method
   b) Any other method; please write it down.
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16. Do you have any problem during teaching Computer Science?
   a) Yes □  b) I have so many problems □  c) I have, but little □

17. What is the most remarkable problem when you teach Computer Science?
   a) Students have no access to computers.
   b) Teachers have no access to computers.
   c) Both teachers and students have no access to computers.
d) Both have access to computers, but there is no electricity.

e) We do not have professional knowledge for teaching computer science.

f) Any other problem; write it down

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18. Which kind of facilities do you have for teaching Computer Science?

a) We have only textbooks for teaching Computer Science.

b) Some students use their personal computers in the classrooms.

c) I have found just one computer for all the students in the classroom.

d) Any other facilities; please write it down.

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19. What do you think, is it possible to learn computer science without computer?

a) Yes □

b) No □

20. If yes,

How?........................................................................................................................................
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21. If no,

Why?........................................................................................................................................
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22. What will be the possible way of teaching Computer Science, while there are no computers in the classrooms, according to your experience as a teacher of CS?

a) I should teach computer skills theoretically.

b) I should use pictures of computer and different programs and menus during teaching.
c) I should explain only the topics of the textbooks through lecturing.

d) Any other possible way of teaching; please write it down.

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23. What must be done in order to teach the Computer Science well for the students’ better learning?
   a) The Ministry of Education should train all Afghan teachers.
   b) Only expert, well educated and well experienced teachers should teach Computer Science.
   c) Teachers must use various teaching methods for teaching the Computer Science.
   d) Teachers themselves should try to get basic knowledge of Computer Science.
   e) Any other idea:

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24. Is there any difference between teaching Computer Science without computer and teaching CS with computer?
   a) Yes ☐  b) No ☐

25. If yes; what is the difference.

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26. What is your suggestion to the Ministry of Education (MoE) or government for better teaching and learning Computer Science in the future?

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Annex. 2. Students’ questionnaire

Age: …………………… years
Male □ Female□

Education:  (*Please select one option based on your level of education*)
Grade in which you are study: a) 10th class □ b) 11th class □ c) 12th class □
School name: …………………………………………….
Location of school: a) Urban area □ b) Rural area □

Questions

Note: For the multiple choice questions you can use more than one option.

1. What is Computer Science according to your opinion? (you can chose more than one option)
   
g) It is the basic knowledge of computer.
   
h) Complete knowledge about computer and its usages.
   
i) It is the scientific study of the computer programs.
   
j) It is the knowledge about ICT (Information and Communication Technology).
   
k) Any other idea:
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2. Do you study Computer Science in your schools?
   
a) Yes □ b) No □

3. If yes; what topics do you study?
   
a) Basic programs of computer.
   
b) Intermediate programs of computer.
   
c) Definitions of the several parts of computer.
   
d) Usages of computer in everyday life.
   
e) Any other topics; write it down here:
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4. What do you think about the importance of computer science?
   f) Computer Science is important in every part of the life.
   g) Computer Science is important just for the school students.
   h) Computer Science is important for teachers.
   i) Computer Science is important for both teachers and students.
   j) All above.

5. What do you think about your computer’s teacher, is he or she professional and experienced teacher?
   a) They are professional, but do not have experience of teaching computer.
   b) They have experience, but they are not professional.
   c) They are professional and expert teachers.
   d) We do not have teachers for teaching computer yet.

6. Do you have computers in your classrooms?
   b) Yes ☐  b) No ☐

7. If yes, from where did you get them?
   a) Ministry of Education provides them for us.
   c) These are our personal computers.
   d) Some NGOs nongovernmental organization provides them for us.
   e) Other

8. If no; what do you think is it possible to learn computer without computers?
   a) Yes it is possible.
   b) No it is impossible.
   c) It is possible, but so difficult.
   d) It is possible, but just theoretically.

9. Do you have any facilities for learning computer skills?
   a) We have only textbooks for learning computer skills.
   b) We learn them from our teachers by taking notes from the white board.
c) We learn them out the schools in the courses.
d) Actually we cannot learn them.

10. What is your opinion about the textbooks which are written for teaching computer science?
a) They are so useful for the students.
b) Students cannot learn anything from them.
c) They are useful, but just for learning some definitions and introduction of some programs of computer.
d) They are useful, just for 10th class students because they start learning computer for the first time.
e) They are useful for all grades (10, 11, 12).
f) They are not useful because teachers cannot deliver knowledge of computer to the students easily.

a) Strongly agree □ b) agree □ c) I don’t know □ d) disagree □ e) strongly disagree □

12. Students satisfied from their teachers’ teaching.
a) Strongly agree □ b) agree □ c) I don’t know □ d) disagree □ e) strongly disagree □

13. The students completely understand computer skills, when they graduate from 12th class.
a) Strongly agree □ b) agree □ c) I don’t know □ d) disagree □ e) strongly disagree □

14. Learning Computer Science has advantages for the students.
a) Strongly agree □ b) agree □ c) I don’t know □ d) disagree □ e) strongly disagree □

15. You have a lot of problem during learning computer science.
a) Strongly agree □ b) agree □ c) I don’t know □ d) disagree □ e) strongly disagree □

16. What is your remarkable problem during learning computer science?
a) We do not have professional teachers.
b) No access to computer
c) We can learn computer theoretically.
d) Limited periods

17. What strategy of learning do you use for learning computer science?
a) We learn computer skills through memorization.
b) We learn just computer skills by studying our textbooks.
c) We learn them in nongovernmental courses outside the school.
d) We do not have any specific strategy for learning computer skills.
e) Any other idea; please write it.

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18. What is your plan in the future, do you want to learn computer skills better?
a) Yes ☐ b) No ☐ c) I will decide later ☐

19. What is your suggestion to your teachers, for better ways of teaching computer science?
Write it here:
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20. What is your suggestion to the Ministry of Education, for solving your problems?
Write it here:
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Annex. 3

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<th>پوښتني</th>
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<tr>
<td>نوت: په خو خوابه پوښتنو کي کولاي شي له يوه خپله زيات خوابونه انتخاب کړئ.</td>
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<td>1. ICT</td>
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<td>(b) د اوسمئ نري یوه اختراع ده.</td>
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(c) د تدریس په نظر کی یوه کومکی تیکنالوژی ده.
(d) د زده کونکو لپاره یوه لپاره تر خو پری یو د بل سره ارتباط ونیسی او خپلی زده کره 

پیژی ستونزی پری حل کری.
(e) د زده کونکو لپاره د مغلف مسائلو د حل یوه وسیله دم.
(f) که کوم بل نظر لرئ دلته بی ولیکی؟

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2. د کمپیوتر د اهمیت په اره خه نظر لرئ؟

(a) کمپیوتر زده کره د زوند په هره برخه کی اهمیت لري.
(b) کمپیوتر زده کره یواخی د مکتب د زده کونکو لپاره اهمیت لري.
(c) کمپیوتر زده کره د نبوونکو د لپاره اهمیت لري.
(d) کمپیوتر زده کره د نبوونکو او زده کونکو لپاره اهمیت لري.
(e) که کوم بل نظر لرئ وی وی ليکی؟

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3. د کمپیوتر تدریس د مکتب د تولو تولکیو لپاره (له 1 نه تر 12 تولکی پوری) مهم دی.

(a) موافق یم (b) کاملا موافق یم (c) مخالف یم (d) کاملا مخالف یم

4. ستاسی په نظر د کمپیوتر تدریس په کومو تولکیو دیر مهم دی؟

(a) له اوله نه تر شپریم تولکی پوری.
(b) له اومه نه تر نهم تولکی پوری.
(c) له لسم نه تر دولسم تولکی پوری.
(d) د تولو لپاره دیر مهم دی.

5. د کمپیوتر زده کره د زده کونکو لپاره کنوره ده.

(a) موافق یم (b) کاملا موافق یم (c) مخالف یم (d) کاملا مخالف یم
6. د کمپیوتر زده کره له لسم تولګی نه دولسم تولګی زده کونکو لیاره کومی کتی لري؟
(a) د کمپیوتر زده کره دوی له نوی تکنالوجي سره اشنا کوي.
(b) دوی به په تولګی کي د کمپیوتر په استعمال يوه شي.
(c) دوی به د کمپیوتر خيني لمرني پرورگرامونه زده کري.
(d) دوی به د کمپیوتر د اهميت په هکله معلومات لاسته راوری.
(e) که كوم بل نظر لری دلته يي وليکئ؟

7. د کمپیوتر د هغه کتابونو په اره چی د معافر د وزارت له خوا تهيه شوی دي خه نظر لری؟ آیا دا کتابونه:
(a) د کمپیوتر د تدريس لیاره ګټور دي.
(b) د کمپیوتر د تدريس لیاره ګټور نه دي.
(c) ګټور دی خو خيني ستونزي هم لري.
(d) دیزاین ګټور دی.
(e) که كوم بل نظر لری دلته يي وليکئ:

8. د کمپیوتر کتابونه د نورو کتابونو غوندي تدريسی یې.
(a) موافق یم (b) تمام موافق یم (c) کاملا موافق یم (d) کاملا مخالف یم

9. آیا تاسی د دغه کتابونو له تدريس نه راضی باست؟
(a) هو (b) نه

10. که خواه مو نه وي نو ولي دلیل بي وليکئ:

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11. تاسیس یه مکتب کی د کمپیوتر پروگرامونه تدریسو؟

(ا) په لوړه کچه (ب) په منخنی کچه (ت) په ټیتان کچه (د) په لوړه کچه (ه) په ټیتان کچه

12. تاسیس د کمپیوتر په تدریس کي د لاندنیون کومو مینتودونه نه کار اخلي؟

(ا) گروپی مینتود (ب) لکچر مینتود (ج) سوال او خواب مینتود (د) دماسبقي مینتود (ه) که کوم بل مینتود استعمالوئ ويي ليکي:

13. د کمپیوتر په تدریس کي کوم مینتود ډیر ګټور دي؟

(ا) گروپی مینتود (ب) لکچر مینتود (ج) سوال او خواب مینتود (د) دماسبقي مینتود (ه) که کوم بل مینتود ويي ليکي:

14. ایا د کمپیوتر په تدریس ستونژي لرئ؟

(ا) هو (ب) دېری زيایتی ستونژي لرم (ب) لرم پي خو دومره دیري ندى

15. د کمپیوتر په تدریس کي د کومو لویو ستونزو سره مخ یاست؟

(ا) زده کونکي مو کمپیوتر ته لاس رسي نه لري. (ب) منور پخیته (ښوونکي) کمپیوتر ته لاس رسي نه لرو. (ج) پښونکي او زده کونکي کمپیوتر ته لاس رسي نه لري. (د) منور د کمپیوتر د تدریس لپاره مسکلي پوه نه لرو. (ه) که کومه بله لویه ستونژه ارئ دلته پي وليکي:

16. د کمپیوتر د تدریس لپاره کوم سهولتونه لرئ؟

(ا) د کمپیوتر د تدریس لپاره فقط درسي کتابونه لرو.
(b) خریدی زده کونکی خیل شخصی کمپیوتره تولگی ته راوري.
(c) زه فقط یو کمپیوتر د تولو زده کونکو د تدریس لپاره لرم.
(d) که نوری اسانتیاوی لرئ دلته پی ویکی؟

17. خه فکر کوئ د کمپیوتر زده کرې غیر له کمپیوتر نه ممکنه ده؟
   □ (a) هو  
   □ (b) نه

18. که خواب مو هو یو وی نو خنگه ویب لیکی؟

19. که خواب مو نه وی نو ولی ویب لیکی؟

20. ستاسی په نظر کله چې په تولگی کي کمپیوتری نه وی د تدریس لپاره په کوری لاری کومی دي؟
   □ (a) زه باید په نظری دول کمپیوتر تدریس کرم.
   □ (b) د تدریس په چرین کي باید د کمپیوتر او د کمپیوتر د مختلفو پروگرامونو له عکسونو کار واخلم.
   □ (c) زه باید یواخی د کتاب عنوانه او موضوع گانی د لکچیر په دول تدریس کرم.
   □ (d) که کومه بله مناسبه لاره دلته معلومه وی نو ویب لیکی؟

21. د کمپیوتر دنبه تدریس لپاره تر خو زده کونکی پی بی زده کری خه باید وشي؟
(a) د پوهنې وزارت باید د کمپیوټر د تدریس لپاره بشونکی وروظی.

(b) مسلکی او تجربه لرونکی بشونکی باید کمپیوټر تدریس کړی.

(c) بشونکی باید د کمپیوټر په تدریس کي له مختلفو میتودونو خپله کار وکړي.

(d) بشونکی باید کوونکی وکړي چې د کمپیوټر په هکله اساسی معلومات لاسه راوري.

(e) که کوم بل نظر لرئ وی؟

22. ایا د کمپیوټر تدریس د کمپیوټر په موجودیت کی، د کمپیوټر د تدریس سره چې کمپیوټر شتون و نه

لري توابیر لري که؟

(a) هو (b) نه

23. که خواص مو هو وی توپیر پی وی؟

24. د کمپیوټر د بنی تدریس او بنی زده کری پر کې پوهنې وزارت او یا دولت ته خه وراندیز لرئ چې

خه باید وکړی؟ وی؟

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د زده کونکو پوښتنلیک

Annex. 4.

 عمر: ........................................... کاله

 نارینه □ بخښه □ نارینه

 د تعلیم کهه: په لاندېنیو تورو کي وو انتخاب کرئ

 نوم تولکی □ (a) نوم تولکی □ (b) نوم تولکی □ (c) نوم تولکی

 د نومخو نوم: ..............................................................

 د نومخو موقعیت: □ (a) بناري سیمه □ (b) کلیواله سیمه

 پوښتنی

 نوت: په خو خوابه پوښتنو کي کولای شي له يوه نه زيات خوابونه انتخاب کرئ.

 1. ستاس په نظر کمپیوتر ساینس (کمپیوتر علم) خه شي دي؟

 (a) د کمپیوتر به هکله لمړني معلومات لاسته راوله دي.
 (b) د کمپیوتر او د هغه د استعمال په هکله معلومات حاصلول دي.
 (c) په علمي دول د کمپیوتر د پروگرامون لوصتل دي.
 (d) د معلوماتي او ارتباطي تیکنالوجي په هکله معلومات حاصلول دي.
 (e) که کوم بل نظر لرئ وېي ليکئ:

 2. آیا په مکتب کي د کمپیوتر زده کي کوي؟

 (a) هو □ (b) نه □

 3. که خوابونه وی نو کوم موضوعات پکي لولي؟

 (a) د کمپیوتر لرمی پروگرامونه.
 (b) په لوره کچه د کمپیوتر پروگرامونه.
د کمپیوتر د مختلفو برخو تعیینات

(1) د کمپیوتر استعمال به ورځي زوند کي.
(2) که کوم نور شیان لولي ويب ليکي?

4. د کمپیوتر علم د اهميت په اړه څه نظر لرئ؟

(1) د کمپیوتر علم د زوند په هره برخه کي مهم دي.
(2) د کمپیوتر علم پوواخی د مکتب د زده کونکو لپاره مهم دي.
(3) د کمپیوتر علم د پووونکو لپاره مهم دي.
(4) د کمپیوتر علم د پووونکو او زده کونکو لپاره مهم دي.
(5) تول نظرات سپي.

5. ایا د کمپیوتر پووونکي مو مسلکي او تجربه او پووونکي پووونکي دي.

(1) مسلکي دی خو د کمپیوتر د تدريس تجربه نه لري.
(2) تجربه لري خو مسلکي نه دی.
(3) مسلکي هم دي او تجربه هم لري.
(4) مونږ د کمپیوتر د تدريس لپاره پووونکي نه لرو.

6. ایا پوکړکي چي مو کمپیوتری لري؟

(a) هو
(b) نه

7. که که خواب مو او چا درته تهيه کري دي?

(1) د پوهنې وزارت
(2) خپله شخصي کمپیوتر په پوکړکي کي استعمالوو.
(3) غير دولتي موسانت راته تهيه کري دي.
(4) که کوم بل چا درته تهيه کري وي ويب ليکي؟

8. که د امپیری پوتوکی خواب مو نه دي وی نه خه فکر کوی د کمپیوتر زده کره نه کمپیوتره ممکنې ده؟

(a) هو ممکنې ده
(b) نا ممکنې ده
1. د کمپیوتر د زده کردن لپاره کومی أسانتیاوي لري؟

(a) د کمپیوتر د زده کردن لپاره په اخیستلو سره له خیل پترونکی کمپیوتر زده کری کړه.

(b) له تختی نه د نوت په څخه سره له خیل پترونکی کمپیوتر زده کری کړه.

(c) په واقعیت کی موینی کمپیوتری زده کری کړه نه شو کولی.

(d) ممکنه ده خو پره ستونزمنه ده.

2. تاسی د کمپیوتر د زده کردن لپاره کومی أسانتیاوي لری؟

(a) له تختی نه د نوت په څخه سره له خیل پترونکی کمپیوتر زده کری کړه.

(b) له تختی نه د نوت په څخه سره له خیل پترونکی کمپیوتر زده کری کړه.

(c) په واقعیت کی موینی کمپیوتری زده کری کړه نه شو کولی.

(d) ممکنه ده خو پره ستونزمنه ده.

3. تاسی د کمپیوتر د زده کردن لپاره کومی أسانتیاوي لری؟

(a) له تختی نه د نوت په څخه سره له خیل پترونکی کمپیوتر زده کری کړه.

(b) له تختی نه د نوت په څخه سره له خیل پترونکی کمپیوتر زده کری کړه.

(c) په واقعیت کی موینی کمپیوتری زده کری کړه نه شو کولی.

(d) ممکنه ده خو پره ستونزمنه ده.

4. د کمپیوتر د زده کردن لپاره که کی هڅه خه نظر لری؟

(a) د کتابونه د زده کونکو لپاره بیه ګټور دی.

(b) زده کونکه له دی کتابونو زده کری کړه نه کی ته کولی.

(c) د کتابونه په څخه د کمپیوتر د خپره پروگرامونو د تعریفاتو او پیژندگلوی لپاره ګټور دی.

(d) د کتابونه د استمرلیگی د زده کونکو لپاره ګټور دی خه د کمپیوتر زده کری کړه له همدغه تولکی پیل کیږي.

(e) د کتابونه د استمرلیگی د زده کونکو لپاره ګټور دی.

(f) د کتابونه د استمرلیگی د زده کونکو لپاره ګټور دی.

5. د کمپیوتر د زده کردن لپاره ګټوره ده

(a) مخالف يم (b) موافق يم (c) په پوره ډول موافق يم (d) په پوره ډول مخالف يم

6. د کمپیوتر د زده کردن لپاره ګټوره ده

(a) مخالف يم (b) موافق يم (c) په پوره ډول موافق يم (d) په پوره ډول مخالف يم

7. تاسی د کمپیوتر په لپاره ده که د کمپیوتر په لپاره ده

(a) مخالف يم (b) موافق يم (c) په پوره ډول موافق يم (d) په پوره ډول مخالف يم

8. تاسی د کمپیوتر په لپاره ده که د کمپیوتر په لپاره ده

(a) مخالف يم (b) موافق يم (c) په پوره ډول موافق يم (d) په پوره ډول مخالف يم

9. د کمپیوتر په لپاره ده که د کمپیوتر په لپاره ده

(a) مخالف يم (b) موافق يم (c) په پوره ډول موافق يم (d) په پوره ډول مخالف يم

10. د کمپیوتر په لپاره ده که د کمپیوتر په لپاره ده

(a) مخالف يم (b) موافق يم (c) په پوره ډول موافق يم (d) په پوره ډول مخالف يم

11. د کمپیوتر په لپاره ده که د کمپیوتر په لپاره ده

(a) مخالف يم (b) موافق يم (c) په پوره ډول موافق يم (d) په پوره ډول مخالف يم

12. د کمپیوتر په لپاره ده که د کمپیوتر په لپاره ده

(a) مخالف يم (b) موافق يم (c) په پوره ډول موافق يم (d) په پوره ډول مخالف يم

13. د کمپیوتر په لپاره ده که د کمپیوتر په لپاره ده

(a) مخالف يم (b) موافق يم (c) په پوره ډول موافق يم (d) په پوره ډول مخالف يم

14. د کمپیوتر په لپاره ده که د کمپیوتر په لپاره ده

(a) مخالف يم (b) موافق يم (c) په پوره ډول موافق يم (d) په پوره ډول مخالف يم
که کومه بله لوهه ستونزه لرئ ویب لیکی؟

17. د کمپیوتر د زده کری لپاره کومه کرنلاره استعمال‌ونه؟
   (a) د کمپیوتر مهارتونه په یادو زده کړ.
   (b) درسی کتابونه له مخی یې زده کړ.
   (c) په کورسونه کی یې زده کړ.
   (d) د کمپیوتر د زده کری لپاره کومه مشخصه کرنلاره نلرو.
   (e) که کوم بله نظر لرئ ویب لیکی?

18. آیا غواړئ په آینده کې د کمپیوتر زده کرو ته دوام ورکړئ؟
   (a) هو (b) نه (c) روتښه به تصمیم نیسم

19. له تربیتونو لږ د کمپیوتر د بنه تدریس لپاره خه غوښتنی لرئ ویب لیکی؟

20. د کمپیوتر د تدریس او زده کری په برخه کې د پوهنی له وزارت له د خیلی ستونزه د حل لپاره خه غوښتنی لرئ ویب لیکی؟