Role of Teacher and ICT in Teaching – Learning Process (Case Study)

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Abstract
Without any doubt, ICT or Information and Communication Technology had a lot of effects on every social and economic aspect of human life and its effect on communities is so much that the modern world is rapidly transforming into an information society.

From the very beginning of ITC usage for educational purposes, its usage on classes were studied and mostly, results of these researches regarding effect and value of ICT had contradiction with each other. The study described in this article, analyze the reports about self-confidence and claimed skill of a teacher of eighth grade of high school and her students in using ICT in a smart high school in Rasht (Shahed high school for girls) and its usage in class. This study is the result of interviews, questionnaires and observations done about the science course in which both teacher and students used ICT.

Findings show that both teacher and students believed they had enough skill and self-confidence for using ICT and considered ICT as an important part of class and teacher’s role. Also findings confirm researches about teacher’s effect on using ICT in class.

Keywords: ICT, Teaching – Learning, Self-confidence, Skill.
Introduction:

Nowadays, information and communication technologies like radio, television and newer digital technologies like computer and internet are considered as potential and powerful tools for improving and changing educational methods. ICT was used for educational purposes from 1980s, but it is still new in Iran and only in recent years, it has become an important subject. Studies have shown that appropriate use of ICT can speed up the change of place in content and pedagogy which are considered as the core of educational terms in 21th century. Teaching enhanced by ICT, if designed and done properly, can improve the process for learning new knowledge and skills. But anyway, using it has created this question that how it was used and is being used in schools?

ICT may affect education, but its effects are more than socio-cultural aspects and can also affect the teachers’ teachings and skills. This creates an opportunity for increasing the value and meaning of education and learning. Even though many people use ICT in education, but the responsibility of using it in class is mostly on teacher and probably, students. So the teacher’s self-confidence and skill in using ICT can affect its efficiency. In addition to this, teacher’s opinions about the way that ICT should be used and its effects on his or her role are also some of the probable factors that can affect the teacher’s usage of ICT. Students’ knowledge about ICT or their opinion about this knowledge can also be effective, like teacher’s opinions.

ICT is a powerful source for creating knowledge, a suitable basis for transferring contents and an efficient tool for creating interaction in the teaching – learning process in class. One of the important indicators of development in a country is the quality of the education system’s outcome and it depends on the method in which the planned educational information are transferred to students and improving the outcome of teaching – learning process. In today’s world, this crucial task is done by educational technology and efficient use of it in teaching has made this process more realistic and scientific, by stimulating the learners’ different senses, and in addition to enriching the quality of teaching and learning, has also improved the efficiency of teaching and education. Courses like science, geography, geology, biology and even literature can use technological and educational tools.

One of the important things in this case is the opinion of teachers toward technology and its usage in class because teachers won’t accept change easily and for helping them, we have to consider their worries about this issue. It can be said that teachers are ready for using technology in their class when they have entered the technology world themselves and have used it. Using basic programs like Microsoft Office and learning how to work with internet can be a good start. As the teachers’ skills in using computer and different programs increases and they become more familiar with them, they will also be more ready to implement technology in their work and more importantly, they will feel successful without the fear of losing their respect in front of students, colleagues or their superiors when using technology on class and possibly, making mistakes. Only a few of us feel successful when we are experiencing something new for the first time. We
should create an atmosphere and opportunity in school that gives people the chance to experience using technology in class for at least one time and we must understand that change is difficult, but it isn’t impossible. So increasing the teachers’ self-confidence and skill in using computer can have significant effects on quality of education by ICT.

Before advancing, we should give a definition of information technology. Information technology are those technologies that help someone in recording, storing, processing, recovering, transferring and receiving information or to put in simple words, information technology means using different technologies for transferring information.

Using information technology in education has these advantages:

1- Developing and improving the skill of information knowledge. Information knowledge means gathering, processing, publishing information in form of texts, charts and etc. and transferring these information at educational environments.

2- Supporting teachers that are familiar with new technologies and so are also aware of students’ experiences outside of class.

3- Education with a lower cost.

Using information technology in education can face some obstacles and limitations and here are some of them:

1- Lack of support from the educational system regarding teachers who are active in the field on information technology.

2- Limited use of information technology in country’s schools and its teachers.

3- Tendency toward acting in the framework of circular which prevents creative decision making.

4- Spending a lot of time outside of class for creating electronic and digital educational contents without receiving any payment.

5- Traditional view toward teaching and education and avoiding creativity and using new and modern teaching and education methods.

Three main principles of developing information technology in teachers ‘education are these:

1- Teachers should learn about a wide variety of computer’s usage in classroom and educational environments.

2- Information technology should be used in educational conditions and teachers should see its use in action.

3- Information technology shouldn’t get limited to the traditional educational environment. Technology can be used for both supporting the traditional methods of learning and also changing and transforming it.

Teacher’s role in electronic learning is like this:
1- Designing and organizing education
2- Facilitator of discussions
3- Guiding the learning process
4- Simultaneous and non-simultaneous teaching
5- Managing the learning system

But it is difficult for the teacher to play all these roles alone. So some of these duties are done as a group which consists of different experts like educational technologist, educational designer, IT expert and software and hardware engineers. You should note that teacher has a key and unique role in this group and no one or nothing can replace him. Learners and students will also actively take part in the learning process. In technology based educational systems, both individual and group work of learners is possible and they are encouraged to these activities.

Hakimi (1383) in his MA thesis, “Investigation the Effective Factors on not Using Information Technology”, says: “It can be understood from studies and investigations that teachers haven’t become ready to use ICT in teaching. Their trainings and educations regarding this technology were very limited and poor. As the results of study show, teachers aren’t prepared to use computer, hardware and related software even at the basic level”. Ghaffari (1383) in his MA thesis, “Investigating the Performance of Trained Teachers about ICT and Ones without Training in Tabriz in Educational Year 1382 – 1383”, writes: “For studying this case, 37 questions were designed about their level of familiarity with computer software, amount that they use these software and other educational tools in their teachings, their opinion about ICT courses and evaluating the ICT courses that were held before and for answering these questions, 10 high schools were chosen from all 5 districts of Tabriz. The results showed the low and bad performance of teachers who weren’t trained to use ICT”.

Somayyeh Takband also done a research in 88 – 89 with the name of “Role of ICT in Increasing the Quality of Teachings done by Teachers of Technical High Schools of Tehran” and showed that teachers believe that using ICT in educational environments can have positive effects on quality of their teachings and will also create some motivation for learning in students and will create new methods in teaching and learning process.

Professor Johnson has studied the progress of ICT’s development in Australia from the beginning of 1990s. In the beginning of 90s and when this topic was introduced in form of hardware, he says that teachers had a sense of lack of self-confidence, fear of technology and fear of this that they can’t manage the class, but 5 years after the program for ICT development had started, they found self-confidence. They are no longer very worried about what they should do when computers broke. So we should reach a clear understanding that there is no need for ICT to cover all our educational aspects. In 2012, another study was done by Averdy Cook and Will Dawson from Curtin University on Australia’s schools and it showed a relation and connection between self-confidence and skills in using ICT by teacher and students. Analyzing the performance of three schools in Norway showed that when students have access to
technology easily and conditions are suitable for them to think creatively, it is more likely that their skills and knowledge will increase.

But in all three schools, there were cases of copying, wasting time and presenting poor quality works and the ease of acquiring information and contents from internet was considered as an issue. Students should learn to use the technologies that are available to them properly. If not so, this technology will only become a mean for entertainment and will have no effect on increasing their scientific ability. The experience of computer based schools in Turkey showed that information technology is a powerful tool for teaching and learning process. Singapore is one of the few countries that were able to take some serious steps toward combining ICT with approaches regarding teachers and students education. In England and Norway, students will go to virtual scientific trips and the results of programs done in this countries show that virtual trips can be very effective in education and teaching. But this is only possible if a good plan is designed for this and technical requirements are available. Educational technology has a significant role in developing and modernizing teaching and education in China and China’s government has spent a lot of effort on this during the past 20 years. From 1990, China gradually started to use information technology in education and advances and breakthroughs in computers and multimedia technologies has created many new opportunities and tools for education.

The aim of the research

The aim of this study id to investigate and analyze self-confidence and claimed skill of a teacher of third grade of high school and her students in regard to ICT, its role in class and its estimated effects on teacher’s role. The main questions in this study are these:

1- How can we implement ICT programs in an eighth grade high school class?
2- What is the degree and level of self-confidence and claimed skills of teachers and students about ICT in eighth grade of high school?

Discussion

This study was done in an urban high school (Shahed high school for girls in Rasht). First, the list of smart schools of Rasht was analyzed because the case study should have these conditions:

Computer lab with enough computers that there should be at least one computer for every two students or less. This ratio was chosen because it can greatly affect students’ access to resources and the way that they use ICT. Teachers of eighth grade of high school who use ICT, especially smart board, in their teaching and being located in urban area of Rasht so that we reduce the probable effect of areas with no internet access which limits the use of ICT to offline software. Statistical population of this study is a eighth grade class of high school for girls with 28 students and one teacher.
Research Proposal

For gathering information in this research, we have used methods of case study that use interviews, observations and questionnaires as sources of information; in this case, we have specifically used open questions and questions with Likert style in the designed questionnaires for students and teachers, interviewing with teacher before and after observation and observing and analyzing the class. Information gathers by these methods were combined with each other so that we can do this study on the scale of whole class; because this will create an atmosphere and physical and social background that by using it, we can clarify and describe the current issue and give some scientific definitions for it.

Having different information sources make triangulation possible for us, because we can compare teacher’s answers to questions asked during interview with results of observations and then compare both with answers of questionnaires.

Class Observations

Class began at 11 AM and computers were turned on before class started and every two students had one computer. There were 13 groups each with two members and one student was working alone (one of students was absent). For start, teacher first asked students to listen to her so that she can give them some description and details about the program that they were going to use by using smart board. Then teacher did an example for students by using the program and told them that they should say their opinion about their group member’s work. Then she described to them in a few steps what they should do. Both normal whiteboard and smart board were used; whiteboard was used for listing the concepts that were going to be searched and smart board for describing and giving details about the program. Teacher also used zoom feature of smart board for showing important details to students. This part of study took about 7 minutes. Then students started to work with computers and during this, teacher walked in the class and supervised them. Because of high sound volume of program, teacher asked students to lower the program’s sound volume and also remembered them that they should give the control of mouse and computer to their group member. There was a little interaction in groups at the beginning, but this interaction was very limited.

At the end of this part of study, interaction in groups had increased a lot, but this wasn’t true about the interaction between groups; but we should note the most interaction was with the program. After 20 minutes, teacher asked students to pay attention to her and asked who enjoyed this little game and everyone raised their hands and who had some problem in searching that 4 students raised their hands.

Two groups of students were still working with their computers when teacher was speaking, so she reminded them that their work with computers is done. Then the program was closed, computers were shut down and students were asked to pay attention to the teacher. She asked one group to become volunteer to use smart board for playing the game about identifying optical
tools in front of class. She also noted to them that they shouldn’t both touch the screen at the same time. During the game, students were watching it and taking part in it. After 4 minutes, teacher asked some questions about the program and asked if they will use this website during weekends or holidays and some students raised their hands in approval. After the questions were done, teacher ended the class with this statement that even though what they had done today was considered part of their study, but it was fun to do.

Results of Students’ Questionnaires

Regarding the first questionnaire about different kinds of ICT that students believed a high school teacher should know how to use, 20 answers were gathered. The most repeated answers were these: laptops or notebooks, internet, desktop computers, smart boards, internet website (special websites for study and education or general websites) and email (7 students didn’t answer the questions). For question about importance of a high school teacher’s skill and ability for using ICT, 23 students answered important or very important. In answer to question about what should also be considered and paid attention to when teacher is using ICT, 20 answered nothing or there is nothing special, two answered software, two said internet websites, another two mentioned security and one student answered information.

An open question about the importance of ICT’s role in class study was asked from students and from 23 gathered answers, 20 students wrote its role was important while 3 said it wasn’t important. These are the mentioned reasons by students for ICT’s importance: increased or better learning (6 students), needing ICT for accessing internet (5 students), finding information (4 students), being attractive and enjoyable (3 students) and using computers and laptops in high schools (2 students). About the three students that said using ICT wasn’t important, their reason was that topic and subject could be taught and learned without using ICT and using ICT has just wasted some time. And in answer to the question that if it is possible to teach this topic without using ICT, 10 answered yes, another 10 answered no, 2 said yes and no and another 2 answered they aren’t sure.

Students gave a few reasons for why this subject can be taught and learned without ICT: they could learn this subject by themselves or they knew it from before (8 students), this exercise or work could be done by writing by hand (4 students) and teacher can teach this subject without using ICT (2 students). And these are the reasons for no answers: having internet access was necessary (2 students), ICT was necessary for learning (2 students) and ICT made studying more attractive and enjoyable (1 student).

The results of students’ questionnaires are divided into two categories, one is skill and the other one is self-confidence. Cronbach’s alpha for skill was 0.871 and for self-confidence was 0.865.

Most students mentioned that they know how to work with different kinds of ICT or are skilled in them, so in they answered the question about how skilled they are in different kinds of ICT like this: desktop computers or laptops (95%), internet (90%) and 5 students didn’t answer,
processing and working with documents (85%) and 3 students didn’t answer, email (60%) and 6 students didn’t answer, smart board (89%) and one didn’t answer and presentation software (85%). The field of ICT in which students said they have the lowest skill and self-confidence was movie editing software (56%) and 9 didn’t answer this question.

Most students believed that regarding self-confidence in working with ICT, they are confident or very confident; so this is the result regarding their self-confidence: electronic whiteboard and internet web browsers (both 95%) and desktop computers or laptops, content presentation software and email (all 90%) and one student didn’t answer. The field in which students considered themselves as confident or very confident very much was using photo editing software (63%) and one student didn’t answer. When the average of different skills of students were calculated, these were the highest averages: internet web browsers (4.65), email or message sending (4.25) and desktop computers or laptops (4.15). Regarding self-confidence, internet web browsers and desktop computers and laptops (both 4.45) had the highest average and software for processing and working with documents (4.263) and email or sending messages (4.20) were after them. Average of self-confidence for using image editor software, internet web browsers, internet or sending messages was higher than the average skill of students in these fields.

**Results of Teacher’s Questionnaires**

Teacher’s answer to the open question about required ICT skills for teaching included general computer skills and also skill in using available resources such as smart boards or different software and programs. She considered ICT’s effects on his role as a teacher of high school, very important, because she saw ICT as part of students’ world and believed should be aware of different kinds of ICT and their advances. She also mentioned that in evaluating a teacher’s way of using ICT, in addition to skills, you should also consider making sure of equipment and tools good condition for minimizing disorders and breaks, as another criteria. She gave the highest score of skill, or expert, to his skill in working with video projectors (5) and lowest score to her skill in using statistical or database software (2); she gave himself the score of 4 in all other fields. The score that teacher gave to her self-confidence was 4 in all fields; except statistical and database software which was 2.

**Results of Teacher’s Interviews**

Teacher’s answer to the first question of interview before observation in regard to method of using ICT in teaching, emphasized on every two students using one computer for accessing to website for practicing optical tools. In answer to this question that what her favorite method is for using ICT in class, he mentioned laptop. To be more precise, she said that prefers every two students to use a laptop in class or lab and use smart board for giving descriptions and details (about programs or works). She also mentioned that by emphasizing on the way and method that optical tools and equipment should be used, ICT can be used a part of the results of learning. Interview after observation was focused on the subject and topic that was taught. At the end, teacher briefly said that using ICT in teaching, was useful for students; because it clearly
improved students’ understanding and knowledge of optical equipment (in regard of learning and remembering, this subject is considered as one of the difficult subjects of science and also it is the basis of optical section of science in high school books, so learning it well and completely is necessary). Also, using ICT will make the subject more attractive and enjoyable and introduced a program to students that they could even use during holidays.

Conclusions

Teacher’s usage of ICT in form of methods that reflect her opinions, is in accordance to ideas and theories of acquiring and adaptation of ICT. In fact, interaction between teacher’s teaching method, ICT and advances and breakthroughs in using it, proves the method of adapting ICT and then using it. It seemed using smart board and computer was effective in keeping the motivation and interest of students and during the interview after observation, she emphasized on this again. Unlike what was said in result of previous researches, differences between the skill and self-confidence of teacher and students, which was claimed by themselves, doesn’t show the advantage of students. Level of skill and self-confidence of teacher in using a form of ICT that was suggested and chosen by herself and its use in class was observed and investigated, reflects this belief that teachers should be able to use ICT and also should be able to use and implement it efficiently. In addition to this, enthusiasm and skill shown by teacher and students for using ICT, shows something that is becoming a crucial skill and also shows the high degree of motivation and joy that ICT can give. This aspect has the potential to develop and advance by using different kinds of new tools and equipment that each day enter the world of ICT.

The low number of participants in this study limits the ability to expand the results of this study to whole society. But using case study in this research enabled us to investigate the current situation and doing this for reaching the study’s goal seemed a logical solution. The subject of study was limited to physical and social aspects of class and this limitation defined the framework in which this study was done. In addition to this, the fact that this technology has multi aspects and dimensions is based on framework of a fact that is very similar to use of ICT in other high schools with similar facilities (especially in science course). The field of study and research in ICT is very vast and extended and in this research, we tried to cover and consider the ones that are more important in teaching and learning process of students. You must note that every one of topics and subjects that were studied in this research, can be investigated further and in more details and divided into smaller parts and discussed about. We hope to see more success in field of ICT by exceptional attempts of researchers and more support from officials and government.
References

4- AttaranM., 1383. Information technology, basis of reform in education. Institution of development of educational technology in smart schools.
5- Champion F., 1354. Learning for living.
6- Journal of tomorrow’s school. Volumes 1 to 8, 1386.