ICT as a Tool for Teaching Learning Process and Achievement in Subjects of High School Students in District Kulgam

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Abstract: The purpose of this study is to find the effectiveness of Information and Communication Technology (ICT) and its use as a Tool for Teaching Learning Process and academic Achievement. A total of 120 respondents were selected amongst the high school students in Zone Devsar district Kulgam. The Students were classified into two groups namely the Treatment Group (teaching using ICT) and the Control Group (teaching without using ICT). The t-test showed higher value for the Treatment Group as compared to the Control Group. The result indicated that ICT enhanced achievement of students. The use of ICT as a tool during lessons conducted in classes has improved the learning outcomes of both male and female students and therefore the contribution should be recognized by all teachers in order to enhance students' achievement in academic. Based on the findings, it is mandatory to use ICT as a tool for teaching learning process for high school students to improve their academic achievement.

1. Introduction

Information and Communication Technology (ICT) is widely used in education for collection, management, and analysis. ICT in education includes a variety of tools, such as computers, CD-ROMs, projection TVs, word processors, image graphic software, email, and Internet-based communication technology. ICT use can influence teaching and learning styles by changing the emphasis from a teacher-centered to a learner-centered style and provides opportunities to improve information-reasoning skills, communication skills, higher thinking skills, creativity, and problem solving (Shaikh & Khoja, 2011; Yusuf & Afolabi, 2010). ICT is being applied successfully in instruction, learning, and assessment. ICT is considered a powerful tool for educational change and reform. A number of previous studies have shown that an appropriate use of ICT can raise educational quality and connect learning to real-life situations (Lowther, et al. 2008; Weert and Tatnall 2005). As Weert and Tatnall (2005) have pointed out, learning is an ongoing lifelong activity where learners change their expectations by seeking knowledge, which departs from traditional approaches. As time goes by, they will have to expect and be willing to seek out new sources of knowledge. Skills in using ICT will be an indispensable prerequisite for these learners. ICT tends to expand access to education. Through ICT, learning can occur any time and anywhere. Online course materials, for example, can be accessible 24 hours a day, seven days a week.

Teleconferencing classrooms allow both learner and teacher to interact simultaneously with ease and convenience. Based on ICT, learning and teaching no longer depend exclusively on printed materials. Multiple resources are abundant on the Internet, and knowledge can be acquired through video clips, audio sounds, visual presentation and so on. Current research has indicated that ICT assists in transforming a teaching environment into a learner-centered one (Castro Sánchez and Alemán 2011). Since learners are actively involved in the learning processes in ICT classrooms, they are authorized by the teacher to make decisions, plans, and so forth (Lu, Hou and Huang 2010). ICT therefore provides both learners and instructors with more educational affordances and possibilities. More specific benefits of using ICT in education are described below.

Importance of Present Study

Assist students in accessing digital information efficiently and effectively As Brush, Glazewski and Hew (2008) have stated, ICT is used as a tool for students to discover learning topics, solve problems, and provide solutions to the problems in the learning process. ICT makes knowledge acquisition more accessible, and concepts in learning areas are understood while engaging students in the application of ICT. Support student-centered and self-directed learning Students are now more frequently engaged in the meaningful use of computers (Castro Sanchez and Aleman 2011). They build new knowledge through accessing, selecting, organizing, and interpreting

information and data. Based on learning through ICT, students are more capable of using information and data from various sources, and critically assessing the quality of the learning materials. Produce a creative learning environment ICT develops students' new understanding in their areas of learning (Chai, Koh and Tsai 2010). ICT provides more creative solutions to different types of learning inquiries. For example, in a reading class, e-books are commonly used in reading aloud activities. Learners can access all types of texts from beginning to advanced levels with ease through computers, laptops, personal digital assistants (PDAs), or iPads. More specifically, these e-books may come with some reading applications, which offer a reading-aloud interface, relevant vocabulary-building activities, games related to reading skills and vocabulary acquisition, and more. Therefore, ICT involves purpose designed applications that provide innovative ways to meet a variety of learning needs to promote collaborative learning in a distance-learning environment

Koc (2005) mentioned that using ICT enables students to communicate, share, and work collaboratively anywhere, any time. For instance, a teleconferencing classroom could invite students around the world to gather together simultaneously for a topic discussion. They may have the opportunity to analyze problems and explore ideas as well as to develop concepts. They may further evaluate ICT learning solutions. Students not only acquire knowledge together, but also share diverse learning experiences from one another in order to express themselves and reflect on their learning. Offer more opportunities to develop critical (higher-order) thinking skills Based on a constructive learning approach, ICT helps students focus on higher-level concepts rather than less meaningful tasks (Levin and Wadmany 2006). McMahon's study (2009) showed that there were statistically significant correlations between studying with ICT and the acquisition of critical thinking skills. A longer exposure in the ICT environment can foster students' higher critical thinking skills. Thus, schools are strongly advised to integrate technology across all of the learning areas and among all learning levels. Where this is done, students are able to apply technology to the attainment of higher levels of cognition within specific learning contexts.

Improve teaching and learning quality

As Lowther et al. (2008) have stated that there are three important characteristics are needed to develop good quality teaching and learning with ICT: autonomy, capability, and creativity. Autonomy means that students take control of their learning through their use of ICT. In this way, they become more capable of working by themselves and with others. Teachers can also authorize students to complete certain tasks with peers or in groups. Through collaborative learning with ICT, the students have more opportunity to build the new knowledge onto their background knowledge, and become more confident to take risks and learn from their mistakes. Further, Serhan (2009) concluded that ICT fosters autonomy by allowing educators to create their own material, thus providing more control over course content than is possible in a traditional classroom setting. With regard to capability, once students are more confident in learning processes, they can develop the capability to apply and transfer knowledge while using new technology with efficiency and effectiveness. For example, in an ESL listening and speaking class, students may be asked to practice their pronunciation using an online audio dictionary. They are required not only to listen to the native pronunciation from the dictionary, but also to learn the definitions and examples of a new vocabulary item. They then have to make a recording of their own pronunciation and provide examples of how this new word is used in context. Before completing this task, they have to know which browser to use in order to search a suitable online audio dictionary. They will have to browse several online dictionaries, and select the one that best meets their learning needs. In addition, finding good software to record their voice is another prerequisite for these learners. Therefore, the whole learning process enriches students' learning skills and broadens their knowledge beyond what they already know. By using ICT, students' creativity can be optimized. They may discover new multimedia tools and create materials in the styles readily available to them through games (Gee 2007, 2011), CDs, and television. With a combination of students' autonomy, capability, and creativity, the use of ICT can improve both teaching and learning quality. Support teaching by facilitating access to course content Watts-Taffe et al. (2003) found that teachers can act as catalysts for the integration of technology through ICT. If the encouragement, equipment, and necessary technological support are available from institutes for the teachers, developing an ICT class will be easier for them. The main responsibilities of these teachers will be changing their course format, creating and explaining the new assignments, and arranging for the computer lab through their technology learning specialists or assistants. In sum, as Reid (2002) has indicated, ICT offers students more time to explore beyond the mechanics of course content allowing them to better understand concepts. The use of ICT also changes the teaching and learning relationship. Based on the findings of Reid's study, teachers reported that the relationship between teacher and learner is sometimes reversed with regards to information technology. This relationship boosts students' confidence when they are able to help teachers with

technical issues in the classroom. Therefore, ICT changes the traditional teacher centered approach, and requires teachers to be more creative in customizing and adapting their own material.

Cook and Finlayson (1999) indicated that the increased use of ICT in the community provided opportunities for students to gain experience that will encourage them in learning. They added, if the use of ICT in learning and teaching produced favorable effects, teachers will be more confident of the education system in the future. Norzita (2004) revealed that the minimum level of the skill of using computers and ICT amongst teachers in teaching and learning of Science was high. However Sutherland et al. (2004) stated that ICT will enhance learning if teachers plan to incorporate into learning activities carefully in lessons but it will, in turn, becomes useless without good plans. Students must be encouraged to understand the process involved. Becker (2001) suggested that teachers' expertise in ICT was an important factor in its successful use in lessons. Government has provided materials and facilities such as laptops, LCDs, CDs, guide books, textbooks, reference books, activity books to help teachers in teaching. Therefore, teachers were encouraged to take advantages of ICT in teaching and learning in order to produce a big impact in education field (Romai Nor, 2003). Lim (2005) found that the use of ICT in teaching and learning allowed students to be active in finding information and build knowledge from information obtained by the chance to cross-link between knowledge of subjects without restricted by time and distance. Fun (1990) conducted a study on the attitudes of the Form Six students during computer-aided activities in Geography classes. It showed that students have positive attitudes towards the use of computer which was considered as an effective technique of teaching and learning pedagogy by students. According to Kubiatko (2010), the results of students' attitudes toward ICT use in teaching and learning Science subject among high school students were based on statistical evaluation. It is against this background that the present investigation feels that there is a need to conduct a research paper on **"**ICT as a Tool for Teaching Learning Process and Achievement in Subjects of High School Students in District Kulgam".

2. Statement Of The Research Topic

The research topic suggested for the study is:
"ICT as a Tool for Teaching Learning Process and Achievement in Subjects of High School Students in District Kulgam"

3. Objectives Of The Study

In order to carry out the evaluative study meaningfully, the following objectives are formulated for the study:

1) To find and compare the students achievement in Pre-test session between the treatment group and control group.

2) To find and compare the students achievement in Post-test session between the treatment group and control group.

3) To find and compare the students achievement in comparison the Pre-test and Post-test session between the treatment group and control group.

4) To find and compare the female students achievement by using ICT as a tool and using traditional method.

5) To find and compare the male students achievement by using ICT as a tool and using traditional method.

6) To find and compare the student's achievement based on gender by using ICT as a tool and using traditional method.

3. Hypothesis:

1) There will be significant difference in the student's achievement in Pre-test session between the treatment group and control group.

2) There will be significant difference in the student's achievement in Post-test session between the treatment group and control group.

3) There will be significant difference in the student's achievement in comparison the Pre-test and Post-test session between the treatment group and control group.

4) There will be significant difference between the female student's achievement by using ICT as a tool and using traditional method.

5) There will be significant difference between the male student's achievement by using ICT as a tool and using traditional method.

6) There will be significant difference between the student's achievement based on gender by using ICT as a tool and using traditional method.

4. Methodology And Procedure:
a) Sample

Random Sampling was used to ensure the generalization and the accuracy of the data. Population of this study consists of high school students in district Kulgam in Zone Devsar. 120 Respondents were randomly selected amongst the population as 60 students (30 male and 30 female) were selected for the Control Group and another 60 (30 male and 30 female) students for the Treatment Group.

b) Tool (Self Constructed Questionnaire):

For this experimental study, a set of pre-test questions were given out to the Control and Treatment groups at the beginning of the study. A set of post-test questions (that same as the pre-test questions) were

given out to both groups after the experiment is conducted.

The pre-post test questions were developed after scanning the all the high school subjects of the students which were taught in their schools. Besides, some experts related to the fields were also consulted during the preparation of the questions. The questionnaire was drafted with 80 items and was circulated to the experts for comments. Thereafter, the suggestions and comments made by the experts were in corporate before the final format was drafted. The items rated by the experts of the questionnaire were finalized with 50 items.

c) Administration And Scoring:

The questionnaire was administered to the selected sample by hand. The pre-test was conducted for both groups and data was collected for analysis. Then, an experiment was carried out for both groups. For the Treatment Group, they have to use ICT during their lessons for one month whereas, for the Control Group, their lessons were carried out without use of ICT. Following the experiments, a post-test session has been conducted for both groups for data collecting.

5. Analysis And Intrepretation:

In order to achieve the objectives formulated for the presented study the data collected was statistically analyzed by employing Mean, S.D, and T-Test.

Table 1 Showing the comparison of students' achievements in pre-test session between the Treatment Group and the Control Group

Test	Group	No	Mean	S.D	T-Value	Level of Significance
Pre-Test	Treatment Group	60	23.33	2.70		Not Significant at 0.01
Pre-Test	Control Group	60	23.96	2.96	1.28	

The mean score for the Treatment Group was 23.33 and the mean score for the Control Group, was 23.96. These results showed that there was no significant difference in students' achievement in School subject between both groups in pre test session. The t-test analysis showed that the t-value was 1.28 which is lesser than the table values at 0.01 level of significance, hence, the hypothesis is rejected and thus it is found that there will be no significant difference in the student's achievement in Pre-test session between the treatment group and control group.

Table 2 Showing the Students' achievements in post-test session between the Treatment Group and the Control Group

Test	Group	No	Mean	S.D	T-Value	Level of Significance
Post-Test	Treatment Group	60	53.8	2.64		
Post-Test	Control Group	60	44.3	2.42	20.65	Significant at 0.01

The mean score for the Treatment Group was 53.8 and the mean score for the Control Group, was 44.3. These results showed that there was significant difference in students' achievement in School subject between both groups in post-test session.

The t-test analysis showed that the t-value was 20.65 which is higher than the table value at 0.01 level of significance hence the hypothesis is accepted and found that "There will be significant difference in the student's achievement in Post-test session between the treatment group and control group". This concluded that ICT use in teaching learning process affected student's achievement.

Table 3 Showing the comparison of students' achievements in Pre-test and Post-test session between the Treatment Group and the Control Group

Test	Group	No	Mean	S.D	T-Value	Level of Significance
Pre-Post	Treatment Group	60	30.47	3.77		
Pre-Post	Control Group	60	20.34	3.61	22.31	Significant at 0.01

The t-test was also conducted to analyze the achievement of student for both groups. The aim was to prove that there was a significant improvement for both groups of students achievement in school subject. The mean and standard deviation values (mean = 30.47; SD = 3.77) proved that there was a high improvement for the Treatment Group. Hence, these indicated that there were significant differences in student achievement between pre-test and post-test sessions. The Control Group showed that the value of mean was 20.34 and the

value of standard deviation (SD = 3.61) showed that there was only a slight achievement in the Control Group.

The t-test analysis showed that the t-value was 20.31 which is higher than the table value at 0.01 level of significance hence the hypothesis is accepted and found that "There will be significant difference in the student's achievement in comparison the Pre-test and Post-test session between the treatment group and control group". This concluded that ICT use in teaching learning process affected student's achievement.

Table 4 Showing the difference of female students' achievements with teaching ICT use and without ICT use

Test	Group	No	Mean	S.D	T-Value	Level of Significance
Female	Treatment Group	30	53.9	3.05		
Female	Control Group	30	40.2	2.25	19.65	Significant at 0.01

Table 4 showed that the mean value for female students' achievements with teaching using ICT was 53.9 and for teaching without using ICT was 40.2. This study has found out that the female students' achievements increased when ICT was used in lessons compared to the achievement without using ICT. The t-test analysis showed that the t-value was 19.65 which is higher than the table value at 0.01 level of significance hence the hypothesis is accepted and found that "There will be significant difference between the female student's achievement by using ICT as a tool and using traditional method".

Table 5 Showing the difference in male students' achievements by teaching using ICT and without using ICT

Test	Group	No	Mean	S.D	T-Value	Level of Significance
Male	Treatment Group	30	61.8	2.58		
Male	Control Group	30	40.46	2.18	24.69	Significant at 0.01

Table 5 showed that the mean value of male students' achievements in School subject by teaching using ICT was 61.8 which is significantly different from the mean value 40.46 of students' achievements by teaching without using ICT. The data also found that the achievement of male students which have been taught by using ICT was better than the achievement of male students that have been taught without using ICT.

The t-test analysis showed that the t-value was 24.69 which is higher than the table value at 0.01 level of significance hence the hypothesis is accepted and found that "There will be significant difference between the male student's achievement by using ICT as a tool and using traditional method".

Table 6 Showing the difference of ICT use in lessons on student's achievement based on Gender

Test	Group	N	Mean	S.D	t-Value	Level of Significance
Male	Treatment Group	30	61.8	2.58	10.69	Significant at 0.01
Female	Control Group	30	53.8	3.05		

Table 6 showed that the male mean value was higher than female students (male = 61.8, female = 53.8). These indicated that ICT use in lessons provided more positive impact to males compared than female students.

The t-test analysis showed that the t-value was 10.69 which is higher than the table value at 0.01 level of significance hence the hypothesis is accepted and found that "There will be significant difference between the student's achievement based on gender by using ICT as a tool and using traditional method".

6. Conclusions, Findings & Suggestions:
The main purpose of this study was to investigate the ICT as a Tool for Teaching Learning Process and Achievement in Subjects of High School Students in District Kulgam. As a result of this study, it was found that the use of ICT in teaching and learning has improved the achievement in subjects of high school students. The comparison of students' achievements showed that the Treatment Group had higher achievement than the Control Group. It was concluded that there was a significant difference in achievement of subjects of high school students between both groups. This indicated that the achievement of students was increased when teacher used ICT in their teaching and learning. According to Pittard, Phil and Jessica (2003), ICT provided significant contribution to

teaching and learning in all subjects and to all ages. ICT can motivate children and engage them in learning, besides meeting individual learning needs. According to the Bruner (1966) theory, to achieve better results, children need motivation to learn. It has been proven in this study where ICT has been used in teaching for one month in the classes. As a result, the students were more interested to study and this helps to improve students' performances. Deaney, Ruthven and Hennessy (2003) also found that ICT has increased the interest and motivation for pupils in schools. Similar study proved that teaching and learning using ICT improved the achievement of moderate learners (Norzita, 2004).

Findings showed that there was a correlation between the use of ICT in teaching and learning with students' achievements. According to the findings of this study, students' achievements increased when ICT is used in a lesson. Students' achievements were found decreasing in a non-ICT based lesson. According to Cox (1999), using ICT in lessons can enhance self-esteem leading to expectations of achieving goals. Becker (2001) also suggested that using ICT in lessons may help students in mastering subject skills. ICT used in lessons especially in the Science subject produced higher quality output of students. Comber et al. (2002) suggested that ICT can be used effectively in the teaching learning process to show video sequences of things that are hard to explain or visualize. Students would be able to construct knowledge easier with the support of ICT (Hull,1995; Gayeski, 1993).

7. Educational Implications:

The use of ICT in teaching and learning helps students to expand knowledge, experience and increase understanding subjects that require visual, audio, flow chart, video presentation and so on. The findings concluded that using ICT in lessons has positive impact on students' achievements. Schools must strive to increase usage of ICT amongst teachers. On the other hand, teachers should put more effort to use ICT in their lessons in order to increase students' achievements. Teachers who are weak in the use of ICT need to participate in ICT training courses. ICT facilities provided by the government in schools must be fully utilized by the teachers.

Using ICT in lessons can also help students to understand concepts through a relationship with a real life situation. The use of ICT in lessons can improve students' achievements compared to using traditional approaches. Moreover, it can make teaching and learning process become more interesting, encouraging and effective. Using ICT in study encourages students to process information better and thus enhances the understanding and improves students' memory (Hull 1995; Gayeski,1993). Both gender showed

improvement in Science subject. However, male students had greater achievement than female students. Differences in cognitive style, interest and motivation between boys and girls might be the causes of the difference in their achievements. Following Kogan (1971), boys were more cognitive than girls. Hence, when ICT was used in their lessons, we can see the differences in both genders' achievements. It is concluded that ICT promotes better learning outcomes on male students' achievement. The overall conclusion from this study reveals that ICT as a tool for teaching learning process has a significant and positive impact in the school subjects. ICT contributes greater performance or achievement of students. Teachers should replace traditional teaching approach with attractive learning style by involving ICT in their lesson.

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