

Impact of Teaching Social Studies through Modern Technology

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Abstract

Integrating technology in education is the need of modern times. But use of technology in curriculum is still a challenging task. There are many educational institutions which are using technology to teach different subjects but still there are many internal and external factors that effects or cause hindrance in integrating technology in curriculum. As there is lack of student's interest and motivation in social studies use of technology can overcome these failures through integrating technology in educational organizations for such kind of subjects. Educational standard in Pakistan is not up to the levels of different developed countries and the same are with social studies subject. The motivation level of students even drops further when the content is taught through using traditional methods of teaching as lecture method or demonstration method. The subject of social studies is dull and boring for the students although this subject is very important for their lifelong learning. It helps students develop their problem-solving skills, critical thinking, and good citizenship. Unfortunately, the motivation strategies are used at higher education level for student's better learning but on primary and elementary level these strategies seem to be missing. The purpose of choosing this topic is that the system is moving towards technology integration in all the subjects, but it should be observed that how much technology is important for the improvement of students learning process. Mostly teachers and students are hesitant of using technology, so the purpose of research was to make them find impact of using technology on teaching of Social Studies. To enhance student's motivation and to impart better conceptual learning and to make the subject interesting for students' researcher has applied technological techniques by making students do online homework in form of watching videos and solving quizzes to overcome traditional learning environment. The current study deals with the effectiveness of using technology in the subject of social studies

through experimental design research. Students participated in this study in the month of September and October 2023. It was experimental designed research in which quantitative data was collected from students based on pre-test and post-test. The study consists of small sample size. Two classes with 30 students in each class were the part of this study in which Social Studies is a mandatory subject. In one class researcher used lecture method for teaching all topics and given regular homework while in other class researcher used lecture method in the class and for homework asked students to watch videos of related topics (uploaded on online portal Easyclass.com) and solve online quizzes. Purposive sampling has been used in this research due to convenience of the researcher. The technique has been adopted to keep uniformity of the subject matter and teaching method. Researcher recommends conducting future research with large sample size for the effective measurement of results. The data was analyzed through SPSS by using statistical techniques to examine the improvement in learning process with and without using technology. Relationship between variables was established through using Independent sample t-test with the help of SPSS version 23. A significant and positive connection determined by using technology in social studies is that it enhanced learning, motivation, and interest of students. It also directly affected student's academic achievements.

Keywords: *Boring subject, computer-based studies, simulation technology, use of technology, impacts of technology, teaching methodology, student's outputs, student's motivation, and student's interest.*

Introduction

The era in which we are living is the era of learning where a student learns faster than ever before. The gadgets and communication technology have changed the ability and method of understanding and took it to a higher level where a student needs modern technologies (gadgets) to keep their interest in studies (Acikalin & Duru 2005, Mensah, E. G., & Osman, S. 2022, Farisi, 2016). Use of technology in education is the need of modern times and today almost all schools of public and private sectors are trying to implement new technological techniques for the conceptual learning of students. A study conducted by Kelly, 2010 & Chan et al, 2022 found that student today spends more time on playing games and watching television. The

traditional method of teaching social studies is boring and dull strategy that brings few problems like lack of interest towards studies, obsolete information in textbooks, limited resources and the traditional teaching methods makes this subject least interesting for students. A study of the experiences of teachers revealed that social studies teacher who uses technology in their classrooms opens new horizons of effective learning for student (Mason et al., 2000 & Bolick, C. M. 2017).

Background of the Research

Raising educational standards is the most important part in the progress of a country. Integration of technology in the field of education is the need of modern times but integrating technology in curriculum is still a challenging task. Normally the students of primary and secondary classes use mobile phones and tablets for their amusement and the piece of information they grasp from them is much faster than traditional teaching methods. Instead of giving boring written homework in social studies students should be given the tasks of watching the stories or documentaries about wars and climate or solar system etc. By using technology for learning the students can not only have access to expansive knowledge but they can play their active role in the global world of internet (Whitworth & Berson, 2002 & Farisi, M. 2016). For the effective use of technology in social studies it should not be used just once or twice but it should be used on daily basis in the classrooms (Berson, 1996 & Berson et al, 2017). The use of technology is very popular nowadays in curriculum designing and implementation as it provides variety of platforms to the students of different levels and helps to enhance student's understanding related to the subject matter.

Research shows that teachers of social studies applied different teaching strategies as teaching through using story telling method, relates the historical incidents with the current scenario, by making them draw maps of different continents to grasp the attention of students towards this subject and engaged them actively in the classroom but unfortunately despite all this there seems a lack of interest in students towards social studies Ravitch, (2003) & Sitali-Mubanga et al, (2018). Here it shows that for the subject of social studies it's not enough for a teacher to just focus on making effective lesson plans, but along with-it teachers also need to

work on how to enhance student's motivation and student's interest in this subject. From decades researchers are making efforts with different research for example Skinner and Thorndike to enhance student's teaching (Anindyarini et al, 2018) that resulted in student's achievement. The better way of enhancing student's interest and motivation is to make them involve in online learning. Instead of giving boring homework students should be given task of watching videos related to topics they read in the class and write their reviews about that. Teachers are online portals available as Easyclass.com and Edmodo where teachers can make students get engaged in solving online quizzes and can also give them badges as reward for their good performance in quiz.

Statement of the problem

From decades much research has been conducted on the perception of students regarding the subject of social studies that it is least liked subject due to outdated information in books, overuse of textbooks, use of lecture method or teacher centered methods in this subject which creates a distance between learners and educators. A research synthesis done by (Becker, 2001& Curry, K., & Cherner, T. 2016) has shown that social studies teachers are least likely to use technology in their classrooms. Most times lecture-based method is used for the teaching of history and geography. Use of audio and visual aids are limited or not available in schools which cause lack of interest of the student towards the subject. In the subject of social studies students are always forced to learn different dates from history through drilling and practice Rice & Wilson, 1999; Berson, (1996) and Herrera, S. G. (2022). The major problem of this subject is the lack of interest of students as majority students of history and geography do cramming for memorizing dates and their objective is to just clear the exam. They do not show any kind of interest in this subject.

To integrate the subject of social studies with technology is the need of modern time. Using different approaches in teaching such as ICT (Hashemyolia et al., 2014; Lee, Lau & Yip, 2016), using Power Point Presentation adopting new teaching techniques (Gul & Rafique, 2017), are the different ways teachers can adopt to grasp the attention of students and create a good learning environment for students. Traditional method of teaching social studies leads students towards lack of motivation and behavioral issues (Manzoor,

Ahmed & Gill, 2014). Content of Social Studies is very difficult for the students to understand through only lecture method. Research shows that teachers of social studies are least motivated to use technology in this subject as it seems to be time consuming task and they find it difficult to manage all the activities when they are forced to complete the syllabus on time.

Specific Objectives

The objective of this study is to explore how use of technology in subject of social studies helps students clear their concepts and enhances their understanding. This subject is one of the boring subjects for the students because of less student's involvement as no activities are designed for the teaching of this subject Haladyna (1982), Schug et al. (1982) and Kelley, C. (2021). The specific purpose was to highlight that using traditional teaching method for the subject of Social Studies in current time makes this subject dull and boring for students and affect their learning.

Another objective is that researcher wants to show if students will be actively involved in learning process through using technology, they will be able to learn in a more efficient manner. To explore how students construct their own knowledge through using technological resources that would help to enhance their interest in this subject.

Research Questions

- 1) What are the impacts of using technology in the subject of social studies?
- 2) How far technique is effective for student's academic achievement?
- 3) What are impacts of innovative strategies on student's academic achievements?
- 4) What are the strategies that can make social studies interesting for students?

Research Hypotheses

This study comprises following three hypothesis. These hypotheses will be analyzed through independent sample t-test.

Hypothesis 1

H₁: Use of technology in the social studies will enhance interest of students.

H₁: Use of technology in the social studies will not enhance interest of students.

Hypothesis 2

H₂: Use of technology in classroom will enhance learning motivation of students toward social studies.

H₂: Use of technology in the classroom will not enhance learning motivation of students toward social studies.

Hypothesis 3

H₃: Technology implementation in classroom will have positive and significant effect on student's academic achievement.

H₃: Technology implementation in the classroom will not have positive and significant effect on student's academic achievement.

Significance of the study

The significance of this study is focused on the use of technology in the subject of social studies for increasing motivation and interest of the students of secondary level in Pakistan. It is not only necessary to give all sorts of information to students related to their subjects, but the most important thing is to make them able to construct their own knowledge by using technology. Different software and games play very important role in learning of social studies as compared to other methodologies of teaching. According to Pye & Sullivan (2001) and Pellas, N., & Vosinakis, S. (2018) computer games and simulations are the best source of teaching students through technology. Use of modern technology and use of different teaching strategies can make the subject of social studies enjoyable for students. Students are studying the subject of social studies without technology in comparison with the students using modern technologies there is not a slight but a big difference in their knowledge, concepts of the topics, confidence, body language and information of latest developments all over the world. Use of technology enhances collaboration, in depth learning, problem solving skills and research ability of students Zhao, Y. (2007) & Zhao, Y., & Lai, C. (2023). Using technology in education is the most important aspect of learning from almost a decade. It helps student's active involvement in learning

process. Technology has brought dynamic changes to education system (Edward, Asirvatham, & Johar, 2018) but unfortunately, despite all this, in Pakistan, educational institutions are still unable to use technology properly for the teaching learning process.

Using technology in subjects does not only help students to understand content but also helps teachers to make difficult content easier for better understanding of students. It provides opportunity to social studies teachers to utilize their time and effort properly in a right way to increase student's interest, motivation, and level of achievements. Integration of technology provides a chance of learning to teachers. It helps in improvement of curriculum through providing proper guideline to students.

Ethical considerations

Ethical consideration is very important in the field of research. A researcher must focus on many ethics such as the data collected should be kept confidential, voluntariness of participants and secrecy of respondents.

The respondents should be well known about what the research is concerning and about non disclosure of their answers and their ambiguity. The respondent would be further brief about the purpose and description of study.

The researchers have followed all the basic principles to avoid critics and rejection by the supervisor or ethics committee. Words in the study were not copied and were rephrased according to need. Research tool was designed by the researcher. Researcher has preserved all ethical standards with the objective to promote the truth in the study without falsifying data. Researchers own biases were not the part of data analysis. All references are cited using APA style. No living or dead physically or psychologically harm because of the current study.

Literature Review

This chapter leads reader toward the impacts of using technology in classroom of social studies. It covers the theoretical background of the study as well as it describes about empirical study. The theory used in this research will be discussed in this chapter in detail. The connection between dependent and independent variable will be described. Literature reviews in the study are mainly dealing with the motivational strategies towards the use of technology and advancement in education. The chapter is focused on the elements of learning by using technology in education to enhance motivation and interest of students. Moreover, the study would cover hypothesized model of research.

According to Mensah et al, 2022 the term ICT has persisted as an essential element. This is because in numerous countries information and communication technology is serving as highway for the exchange of information. It has also become part of educational institutions in their general management. Grabe and Grabe (2007) states that innovation and technology have impact societies and has completely changed people's rationale, working, and living. ICT improves and makes a learner more focused on concrete materials. It also helps teacher to improve their ability of pedagogical methods to develop better students' interaction and to access quality education. According to several studies it's difficult for students to learn and adopt technology but Yelland (2001) argues that in the new era traditional classroom learning is no more effective for the learners to be useful in the workplace of modern society. Moreover, research by Dede (1998) states that Information technology not only helps students to improve in memory preservation but also increases their motivation. Its also effective when dealing with large size of classes (Forcheri & Molfino, 2000). It's a quantitative descriptive survey designed research. According to Sincich (1993), descriptive surveys are convenient for analyzing a range of educational issues such as experiences, demographic data, approaches, observations, and circumstances. The sample size of study was consisting of 107 respondents for which 5-point Likert scale questionnaire was used. The findings of the study show that teachers who integrated technology in their classroom had a positive perspective regarding integrating ICT improves the teaching and learning process in the Social Studies classrooms as it helps in making lessons more engaging, diverse and as well as it allows a teacher to efficiently control the time mechanism for instructions.

Gul & Rafique, 2017 investigates that in the era of 21st century a prompt transformation has

experienced in traditional teaching classroom to the new and developed learning strategies. According to Skilbeck & Connell, 2004 the way teacher uses different teaching strategies it reveals that how much they regard teaching, and the new strategies improve students' attitude towards learning, their learning skills and make them able to manage with the challenges of the rapidly moving world. Students come to the educational organizations from diverse backgrounds if teaching strategies are not up to the mark they may lead students towards distractions, poor functioning and they might get disappointed about their self-efficacy. To overcome all these issues the teachers put all their efforts to make their teaching strategies aligned with student's altered intellectual capabilities with expanded ways. It was a quantitative survey-based study conducted on secondary school teachers with sample size of 253 respondents. The results show that changing teaching strategy increased the capability and developed intellectual abilities of students. It also improved teaching skills and professional escalation of teachers but there is a limitation in the study that researcher refer to conduct more studies like this in order to get clear picture that changing teaching strategies and using the upgraded one can enhance the interest and intellect of students.

Farisi, (2016) examines that technology is the need of modern times. It has changed the vision of education for all the subjects including social studies (Kerka,1997). Currently whole world is practicing to implement technology in all the subjects. Many theories also indicates the significance to make the process of learning more enjoyable and meaningful which was not possible earlier in traditional classrooms (Alexiou-Ray, Wilson, Wright &Peirano, 2003). Integrating technology in the subject of social studies is very important for student's conceptual learning and better strong understanding of subject matter. It also helps to enhance student's interest through active involvement in classrooms.

Acikalin & duru (2005) examines role of technology in the classrooms of social studies. In the present time technology not only provides tool for better learning but it also has changed traditional teaching methods (Asan, 2003). As a result of new technologies and internet classrooms are no more limited to traditional

learning and students can gain more experience and analytical skills (Vanfossen, 2001). In the subject of social studies technology not only helps on an educational level. It also has a significant effect on global, political, social and economic functioning of society (Whitworth & Berson, 2002). Research shows that computer technologies support learning as well as it helps developing student's critical thinking, problem solving skills, and strong decision making power (Berson, 1996; Rice & Wilson, 1999).

Curry & Cherner, 2016 investigates about the practices and philosophies of operative but diverse social studies teachers who settles the demands of teaching in modern times while glorifying their own attitudes of teaching social studies. According to them it's necessary for teachers to align their academic content knowledge bases for the classroom instruction to be meaningful. The use of technology as exemplified by smartphones, tablet devices and laptops has formed a definitive change in societies all over the world (Kuhn 2012). Koehler and Mishra explain content knowledge as a teacher's knowledge about the subject material should be taught in a way that concepts and ideas should be very clear and with the help of technology one can develop and find many ways of accomplishing the task. The study is qualitative in which researcher conducted interview of three participants and did observations. The findings of the research were that all the teachers who were selected for the study were highly skilled and were effective teachers but both used technology in their field in different ways. The study further demonstrates that teachers can use technology in their classes through variety of ways to honor their teaching philosophy and can also promote literacy by incorporating different technological methods of teaching social studies.

Mega. C. et al, 2014 states that student's motivation is the most important concern of all teachers. Self-efficacy is the way to motivate students towards learning. Self-efficacy is about student's belief that they can do something. It plays very important role in engaging students in materials to be learn and student's achievement in education. Teachers need to support students, provide them feedback, and make their students able to develop responsible self-efficacy. Teachers should help students maintain accurate judgment regarding

self-efficacy and help them develop their skills. Teachers should also engage students in some difficult tasks, so they put their efforts to achieve their goals. It is also duty of teachers to foster the belief that ability of every individual is changeable aspect in development.

Berson, (2014) examines that the subject of social studies promotes citizenship, critical thinking, and problem-solving skills. This subject was previously taught by traditional methods of teaching. Nowadays the use of technology has been enhanced in almost all the subjects including social studies. If this subject were taught with the proper usage of technology, it would help raise students' motivation. Use of computer for learning of social studies can increase students learning abilities up to 80%. Such kind of learning provides effective feedback to students that help to improve their motivation and self-efficacy. Ehman and Glenn (1991) consider the use of technological tools in the subject of social studies is very important. Technology integration in the subject of social studies is very limited. For better outcomes and to increase students' motivation there is a need for the implementation of proper technology in Social Studies.

Methodology

This study investigates the impacts of using technology about social studies. This section describes the methodology which will describe how this subject could become interesting for the students by using technology in the homework. The dependent variable of this study was use of technology. The study was experimental design in which quantitative data was collected from the students based on pre-test and post-test and was analyzed through SPSS by using statistical techniques to examine the improvement in learning process. The research tool and student's achievement tests were designed by the researcher. The study covered students of Grade V Cambridge from a school of private sector.

Unit of Analysis

Unit of analysis is one of the most important beliefs in research project. It is the main body that you analyze in your research. The study was designed for students of primary classes. Study investigated the outcomes of students at a Cambridge school student studying in grade V using technology in social studies

and its impacts on their interest, motivation, and academic achievements. Current study matches with the research (Keshta & Harb, 2013 and Wong et al, 2021) that motivates students toward learning through using technology. The pre-test and post-test designed research was conducted and then compared. The students of control group were taught using traditional teaching methods and experimental group would be taught by integrating technology in subject matter. The final academic achievement test was designed based on objective paper and scores were compared to see the academic achievements of both experimental and control group.

Teachers were the unit of analysis who applied technology in a school of private sector in Karachi. There are various teachers of different levels teaching in this school from pre-primary to secondary classes. The researcher controlled the whole process of conducting research as a teacher. Only independent sample t-test was applied, and analysis was done by using SPSS version 23. Student's achievement test was analyzed through graphical representation using MS Excel version 2010.

Research limitations

This study was conducted on 60 students of experimental and control group, where experiment continued for three weeks of duration. The first limitation of current research is small sample size and short experimental program. The researcher recommends increasing sample size with longitudinal study program to make this study more effective and generalized. Another limitation in the experimental study is at the homes in absence of teacher or adult supervisor. There is a possibility that students were engaged on some other social media sites during learning which creates lack of concentration and distraction and has negative influence on student's learning. It is recommended that students should be provided with the learning environment where they would not get the chance of any distraction.

Data collection procedure

Data collection procedure is the procedure of collecting data for gathering measurable information by using statistical techniques to test hypothesis and evaluate results. It can be collected from many sources. This procedure should be accurate according to study as inaccurate data collection can affect the results.

The questionnaire was designed by the researcher and solved by the students of Grade-V in the form of pre-test and post-test in a well-known Cambridge school of Karachi at the end of experiment designed by the researcher. The school is basically divided into three sections pre-primary classes (nursery, prep-1, and prep-2), primary classes (1st till 3rd), and secondary classes (4th till 7th). The permission for conducting research was taken by the Vice principle of primary sections in the form of application. The researcher supervised the whole process of conducting research. The standardized test was also conducted in the start and at the end of experiment. Both the results of pre-test and post-test were compared at the end of research design.

3.15.1 Data analysis technique

SPSS techniques were applied for the data analysis such as independent sample t-test was run to access the importance of student's motivation and interest for learning social studies, and graphical representation for analyzing student's achievement test was done through using MS Excel version 2010.

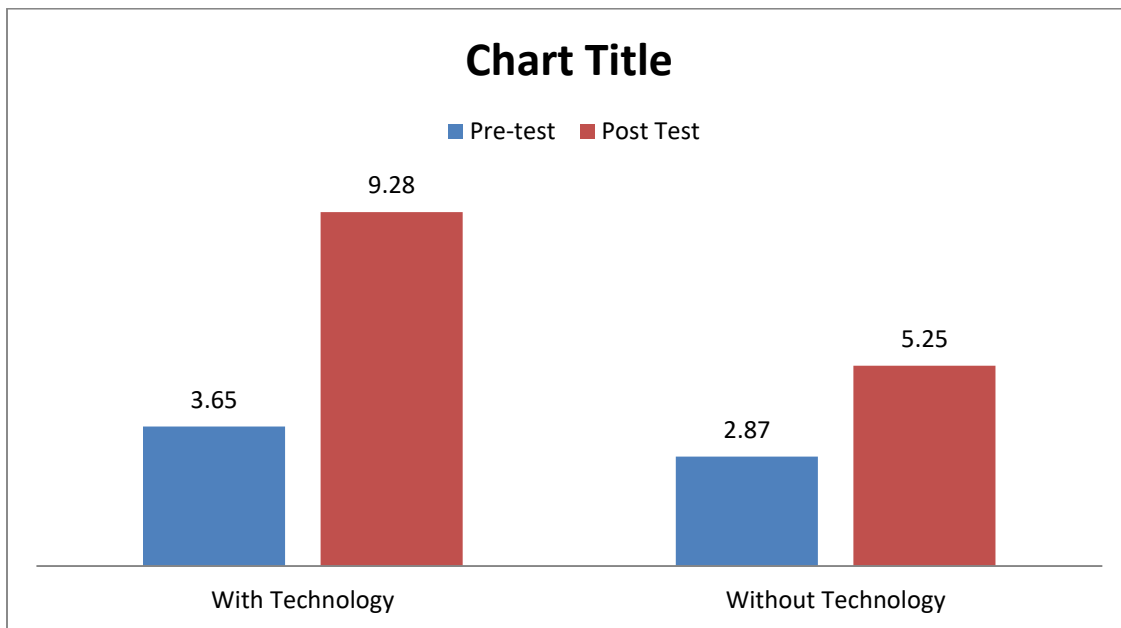
Data Analysis

The study designed to investigate outcomes of technology integration in classroom on student's motivation, student's Interest; students and students' academic achievements for the subject of Social Studies, students of grade V (Cambridge). To accomplish goals and objectives of the study a technology-based program was designed using EASYCLASS portal for students in the experimental group. The portal was used for providing valuable resources related to the content of grade V Social Studies. The pre-test has been conducted and test scores of experimental groups were used to identify the progress in the performance of experimental group participants. The students of control group were taught using traditional learning method, whereas the students of experimental group were taught using both methods traditional and learning management system. To test the difference between academic achievements of students an objective based test was prepared, and the scores were used to check difference in academic achievements of both groups. Along with the achievement test researcher also designed and used a questionnaire to test student's motivation and interest

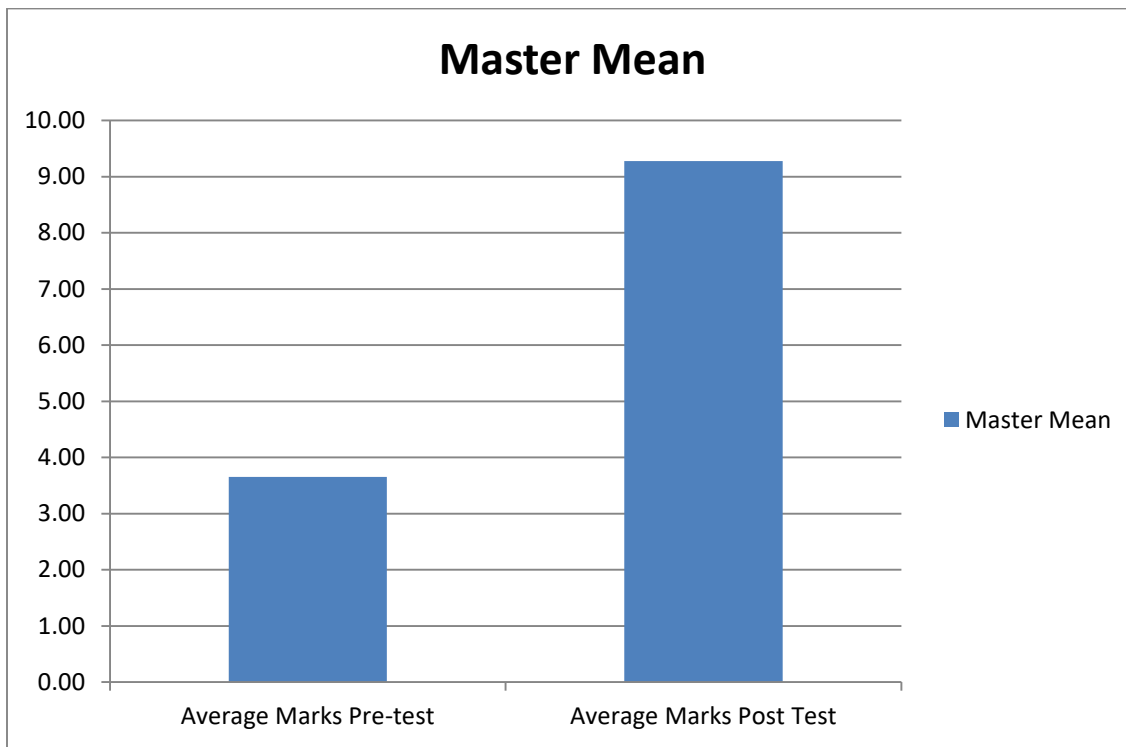
before and after using technology for the subject of Social Studies. After the practice of 3 weeks for both groups research instruments were used to collect data. After collecting data researcher tested hypothesis and performed statistical analysis to answer study questions. For testing hypothesis independent sample t-test has been applied using SPSS version 23.

Analysis of student's Achievement test

The researcher selected two sections of grade V to participate in the study. Each group comprised of 30 students. One group is taught by using traditional teaching method while other is taught by using online learning management system. There are 30 male and 30 female students who participated in the study. Researcher herself is conducting achievement test and student's survey questionnaire to find out what impact technology is having on enhancing motivation and interest of students.



Results show that students score 36% in Pre-test without using any instruction and score 92% in Post-test when taught by using innovative method of teaching. Altogether they showed 56% improvement in learning by innovative method of teaching.



Comparative Analysis

In the following table the significance difference can be seen in between two groups of students taught by using two different teaching methods one by using technology and one by using traditional teaching method. It has been observed in figures that the students used technology performed and learned much better as compared to the students used traditional teaching method for learning Social Studies.

Main study (n=60)

The study sample was determined through the purposive or convenient sampling technique, where students of two sections were selected for the experimental design. For the experiment the researcher was teaching two sections of grade V (section I with 30 students and section J also with 30 students). In both the sections researcher was teaching Social Studies. Researcher only selected these two sections for the experiment to maintain uniformity of teaching content. Researcher offered students to be the part of an online learning management system EASYCLASS. Out of 60 students 30 students of V-J were selected to participate in online activities and remaining 30 students of V-I were selected to teach by using traditional teaching

method. Students of both sections provided with the pre-test to check the effects of using technology in the subject at the end of research.

Control group (N=30)		Experimental group (N =30)	
Female (N=30)			
Control group N=13		Experimental group N=17	
Male (N=30)			
Control group N=17		Experimental group N=13	

Source: Author's estimation

The settings for the control group were traditional learning method or lecture method as it was the most frequently used method in the school offering syllabus of Cambridge O-Levels Social Studies. However, for the experimental group online learning activities were designed by researcher to meet the requirements of research. All students of experimental group not only attended traditional classes for learning but also used an online study portal and performed different learning activities. The most common activity performed by students during experiment was that they attempt and solved quizzes at the end of each topic, 26 students out of 30 found the study interesting, solved quizzes and done rest of the activities with interest but 4 students faced problems due to no access of internet. Researcher's main objective was not only to provide resources to students but also to enhance their motivation. Competence satisfaction was achieved through involving students in online quizzes and giving them feedback through discussions on portal. Majority of the students participated and involved in discussions frequently. Students not only try their best to get good scores in students achievement test but also this activity help them to enhance their interest and motivation toward Social Studies. So, the use of technology proves a useful attempt to help students get motivated toward a subject which was considered boring with use of traditional teaching method. Researcher often uploaded

interesting videos related to the content to make students actively involved in activities. All these activities were designed by researcher to enhance student’s motivation and interest.

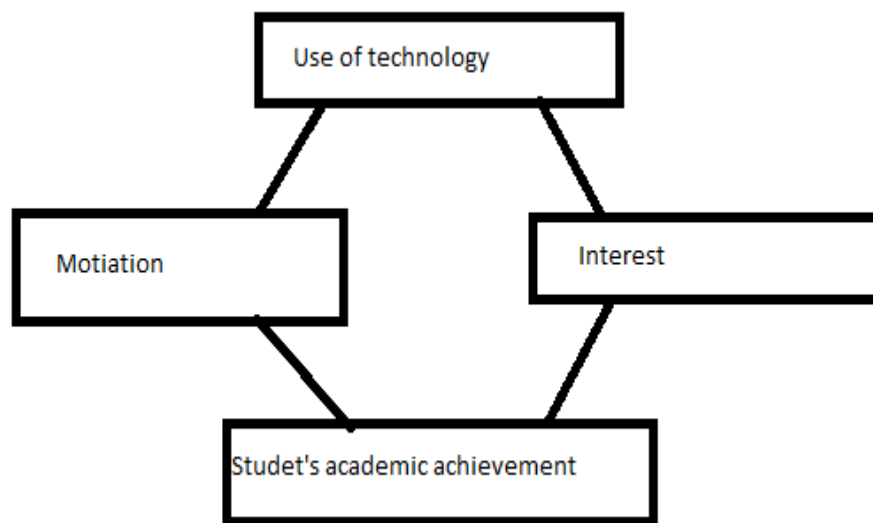
Table 2 Online activities performed by experimental group.

Activities	Number of students	% of involvement
Attempting Quizzes	30	100%
Watching videos	26	87%
Involved in group Discussions	25	83%
Reading messages	25	83%

Source: Author’s estimation

The study is divided into three sections where student’s motivation, student’s interest and impact on academic achievement was observed after applying technology with same control and experimental group.

impact of using technology on student’s motivation, student’s interest, and students’ academic achievement.



H₁: The use of technology in the subject of social studies will help to enhance the interest of students.

H₂: Use of technology in the classroom will enhance the learning motivation of students toward the subject of social studies.

H₃: Technology implementation in the classroom will have positive and significant effect on academic achievements.

Reliability Analysis

Reliability of the data was measured through Cronbach's alpha using SPSS version 23. Reliability values are typically used when researcher used to sum up several Likert scale items to make a summated scale. The Alpha is based on the mean of each item in the scale with every other item. The questionnaire has been designed by the researcher that is comprised of 10 questions (for experimental and control group). In reliability test the value of Cronbach's alpha should be greater than 0.5 (Cronbach, 1951). Reliability of individual items have been measured and shown in Table 3. In this case data is reliable as Cronbach's values are greater than 0.5.

Table 3 Reliability of the instrument

Reliabilities	Cronbach's Alpha
Achievement test	.996
Motivation	.987
Interest	.986

Source: Author's Estimation

Independent sample t-test (pre-test analysis)

Independent sample t-test used to define mean comparison between two groups. If the value of significance is greater than 0.05, means are considered equal Keselman, Othman, Wilcox, & Fradette, (2004) and Godfrey, K. (2019). Researcher has applied these tests to identify differences in student's academic achievements, motivation, and interest among participants of experimental and control group using independent sample t-test. Using criteria for Levene's test, independent sample t-test has measured that shows no difference among the participants of control and experimental group in term of academic achievement, motivation, and interest. Value of significant is greater than 0.05 which shows that performance of academic achievements, motivation and interest are not different in both samples Table 4.

Table 4 Group statistics for independent sample t-test*(Impact of teaching social studies through modern technology pre-test analysis)*

	Groups	N	Mean	Std. Deviation	Mean Difference	t-value	df	Sig, (2-tailed)
Achievement	Experimental	30	28.67	7.563	-0.033	-0.02	58	0.984
	Control	30	28.7	5.26				
Motivation	Experimental	30	1.2	0.235	-0.007	-0.117	58	0.907
	Control	30	1.21	0.207				
Interest	Experimental	30	1.32	0.227	-0.007	-0.108	58	0.914
	Control	30	1.33	0.249				

Independent sample t-test (post-test analysis)

Independent sample t-test used to define mean comparison between two groups. If the value of significance is greater than 0.05, means are considered equal Keselman, Othman, Wilcox, & Fradette, (2004) and Godfrey, K. (2019). Researcher has applied these tests to identify differences in student's academic achievements, motivation, and interest among participants of experimental and control group using independent sample t-test. Using criteria for Levene's test, independent sample t-test has measured that shows significance difference among the participants of control and experimental group in term of academic achievement, motivation, and interest. Value of significant is lesser than 0.05 which shows that performance of academic achievements, motivation and interest are different in both samples Table 5.

Table 5 Group statistics for independent sample t-test*(Impact of teaching social studies through modern technology post-test analysis)*

	Groups	N	Mean	Std. Deviation	Mean Difference	t-value	df	Sig, (2-tailed)
Achievement	Experimental	30	52.5	8.613	-40.3	-20.109	58	.000
	Control	30	92.8	6.805				
Motivation	Experimental	30	1.2	0.235	-3.407	-67.766	58	.000
	Control	30	4.61	0.144				
Interest	Experimental	30	1.32	0.227	-3.24	-50.368	58	.000
	Control	30	4.56	0.27				

4.5 Conclusion

Results from analytical part shows that there is a positive and significant impact of using innovative methods of teaching on student's academic achievements, motivation, and interest. Student's academic achievement is the strongest variable influenced from the technology-oriented teaching and has results in the better and improved performance of students. Further recommendations and findings are discussed in chapter 5.

Recommendations

Recommendations for the teachers

Teachers are mentors and the major contributions for the educational programs. It is the time for them to make themselves familiar with new and innovative teaching techniques and apply the same in teaching learning process to meet international standards of education. It is recommended that teachers of all levels should upgrade themselves and take interest in new technological methods of teaching. They should introduce themselves use of online learning portals to engage students in effective learning and make students involve actively in online learning by giving them interesting homework as watching documentaries, movies of related topic, instead of giving them boring assignments to enhance their interest and motivation for positive learning

outcomes.

Recommendations for the school management

Introducing learning management system for student's positive learning outcomes is recommended by the researcher, where teachers and management work together to enhance student's motivation towards positive learning through active engagement and useful online activities. Furthermore, school management should provide training to teachers (by arranging teacher's training workshops) and students (by providing access to learning management systems) to make them familiar with new teaching learning techniques and skills to use new and advanced technology effectively.

Recommendations for policy makers

Traditional teaching method is still a major part of school's practices. Though technology has integrated in our society, but negative uses are more prevalent than positive outcomes. Policy makers and curriculum developers should incorporate new and advanced teaching methods for example instead of teaching content with boring lecture method they should design activities for students (make them engage in field work, give them training to use technology to collect necessary information regarding new topics) to not only enhance student's learning and motivation towards studies but also to make them involve in productive learning.

Recommendations for the future researcher

In the current study the researcher has discussed about the use of technology and innovation in learning helps to achieve positive learning out comes as well as it enhances student's motivation and interest towards learning, but the study is consisting of small sample size. For future learners it's been recommended to conduct the study with a large sample size and longitudinal design. The future researcher should apply this program for long time span with the development of another instrument to measure the outcomes of students effectively.

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