Enhancing 6ᵗʰ Grade Students' Learning in Social Studies through Technology Based Teaching Approach

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Abstract
This quasi experimental study examined the effect of technology based teaching approaches on the 6th grade students' learning in social studies subject. The participants of the study included two classes of 6ᵗʰ grade students: control group (n=25) and experimental group (n=24) in one of the middle schools in Bhutan. The research instruments consisted of experimental group treatment, survey questionnaire and semi-structured interview questions. The result suggested that there is an affirmative effect of technology based teaching approaches on the 6ᵗʰ grade students' social studies learning achievement test. It was found that mean test scores of the experimental group were higher than the control group on pretest and post test analysis. Further, the findings from the study established that students had a positive perception of learning through technology based instructions, as learners enjoyed, and were better able to understand, what has been taught. The findings from the study concluded that teaching through technology based approaches enhanced students' learning in the classroom, so, it is recommended that teachers apply technology based instructions as a tool to maximize student learning. In addition, building of smart classrooms through digitalization could support students with learning difficulties in different subjects.
Keywords: Technology based Teaching Approach, Social Studies, 6ᵗʰ Grade Students, Bhutan

Introduction

It is widely accepted that modern economic development demands new knowledge and skills; education systems all over the world have undergone a rapid change starting from school leadership practices to diversifying school curriculum and pedagogical approaches to approach this goal. Bhutan is no exception. The goals and strategies implicit in the Bhutanese education system have been clearly reflected in the Bhutan Education Blueprint 2014 to 2024, an official document that provides future guidelines to reformation of Bhutan's education system. Of many reforms, raising the learning outcomes of students comparable to international standards has been given national importance (Ministry of Education, 2014). The ministry is focused on raising the learning outcomes of students and is focused on knowledge, attitude, values, skills and participation, but achieving these outcomes relative to international benchmarks remains a challenge. Further, with the implementation of New Normal Curriculum (NNC) in the country, there is a paradigm shift in teaching and learning (Royal Education Council, 2018). The new transformation in the teaching and learning system is grounded in the principle of competency based learning driven by digital technology to contextualize the classroom learning. But the realizations of such an aim are always hindered by pedagogical methods implemented in the classroom.

Dunn, Beaudry, and Klavas (2002) stated that learners' achievement escalates when teaching methods match their learning styles. One such method that can be implemented easily onto existing classroom practices and structures is the use of different means of information and communication technology (ICT) as a teaching approach. Indeed, the implementation of ICT based approaches is suggested as a necessary part of implementing NNC. The use of technology based instruction, including multimedia, video podcast, video streaming, PowerPoint presentation slides and video clips might have the potential to improve students' academic performance, understanding, skills, and attitudes in a country that is seeking to do just that (Tutty & Klein, 2008). Further, ICT helps in Multisensory delivery, improved self-expression and active learning, cooperative learning, communication skills, multicultural education, and student motivation (Barron & Orwig, 1993 cited in Dooley, 1999). The positive impact of technology based teaching approaches has been thoroughly explored in many studies from elementary to middle school (Archer, Savage, Sanghera-Sidhu, Wood, Gottardo, & Chen, 2014, Cheung & Slavin, 2013, Slavin & Lake, 2008). On the other hand, a few researchers have found that use of technology based teaching approaches does not always improve students' learning achievements (Angrist & Lavy, 2002, Leuven, Lindahl, Oosterbeek & Webbink, 2007). As such, the NNC's call to incorporate technology-based teaching instruction may or may not actually improve test scores. Besides, the research on teaching through technology based approaches has not been conducted so far in the Bhutanese classroom context. This paper sets out to explore how technology can be implemented into a sixth grade social studies classroom context in Bhutan; it is the first study of its kind. Through experimental research method, it examines the following three research questions:

Research Question
- Is there a positive effect of utilizing technology based teaching approaches in a Bhutanese 6th grade social studies class?
- What are the perceptions of students towards learning through technology based teaching approaches in Bhutan?

- What are some of the essential themes that appear from learning through technology based teaching approaches in Bhutan?

Technology based Teaching and Students Learning

The importance of Information and Communication Technology (ICT) was given priority during the post-second world war by the developed countries to increase the efficiency level as well as to give flexible production system (Garrey, 1997 as cited in Büyükbaykal, 2015). Since then, the use of ICT has become popular in many developed countries, particularly in development of knowledge based economies (Kong & Li, 2009) through advancement of knowledge based societies which was possible through quality education system. Education plays a vital role in building knowledgeable society and ICT plays a significant role as it has ability to enhance the quality of learning process and development of both teachers and students in education for more than a century (Passey, 2006; Wang, 2008). Wager (1992), in his seminal work on which much future research in the field has been based, defined educational technology as the process of crafting successful instruction by incorporating computer technology and media. The use of technology based teaching approaches, such as video clips and PowerPoint presentation slides have been positively welcomed in every field of study. Thus, the use of technology for educational and instructional purposes is very important to students as they can do extremely well in learning in any educational context (Christen, 2009). Nevertheless, these tools have great potential to increase learners' satisfaction, retention and understanding concepts and theories (Choi & Johnson, 2005; Koong & Wu, 2011). So, the use of technology as a tool for enhancing learning has been widely accepted in many countries. For instance, it has been known for many years that technology based teaching approaches could increase and improve students' learning achievements (Christmann & Badgett, 2000; Courduff, 2011). They help to develop positive attitudes towards the subject they learn (Behroozian & Sadeghoghli, 2017), because technology based instruction positively impacts cognitive, psychological and knowledge learning

(Harris, Al-Bataineh & Adel Al-Bataineh, 2016; Loes & Saichaie, 2016). In addition, it has been suggested that students' improved performance may be due to the interactive learning environment resulting from the use of technology (Barak, 2006). It is in this work that this study is located. It will seek to explore the impact of implementing technology-based teaching approaches in 6th grade social studies learners in Bhutanese classroom settings.

Research Method

This study employed quasi experimental research design incorporating both quantitative and qualitative approaches. This approach helps to mitigate the disadvantages of both strictly qualitative and strictly quantitative studies (Creswell, 2014). Further, Quasi experimental design is most commonly employed when it is not realistic for the researcher to use random assignment for the study (Gribbons & Herman, 1996). In this study, the researcher incorporated the use of video clips and PowerPoint Presentation slides into the lesson plans. Data were collected through pre and post implementation questionnaires and focus group discussion questions.

Population and Sample

The study was conducted in one of the public middle secondary schools in Bhutan. The participants of the study were 24 (12 male and 12 female) sixth grade social studies students who were taught using technology based teaching approaches (PowerPoint presentation slides and video clips downloaded from a variety of online sources).

Research Procedures

To answer the research questions, the researcher selected the content from the curriculum framework and instructional guide textbook of sixth grade students prescribed by the Royal Education Council (REC) of Bhutan. The topics chosen were "The earth" and "Our country". The selected sample of the study was taught on the chosen topic using technology based teaching approach (PowerPoint Presentation slides and related videos). The lesson was taught four periods in a week over four weeks during the class teaching period. Each lesson was taught for the duration of 50 minutes, with five minutes for pre-task (lesson introduction and lesson

recapitulations), 40 minutes of actual lesson teaching using technology based approach like video clips and PowerPoint presentation, and five minutes for post-task including lesson follow up activities.

Data Collection

Data were collected through learning achievement tests which were developed based on the learning outcomes outlined in the Royal Education Council (REC) curriculum framework and Bhutan Council of School Examination and Assessments (BCSEA). The test consisted of 25 multiple choice questions each carrying one mark. The pretest was employed before employing the treatment to ascertain students' starting achievement in the class and the posttest was carried out after employing the treatment to ascertain students' finishing achievement. In addition to the learning achievement test, a six item questionnaire was developed and used on five-point Likert scales to study students' perception and attitude towards teaching and learning through use of PowerPoint presentation slides and video clips. The five point Likert scale was 5-strongly agree, 4-agree, 3-neutral, 2-disagree and 1-strongly disagree. In addition to quantitative data, qualitative data was collected using focus group interview.

Data Validity and Reliability

The validity of the instrument was assessed by two experts who are experienced social studies teachers with a broader knowledge of teaching the subject for many years. The Validity of the instruments was assured using the Item Objective Congruence (IOC) Index where the experts rated +1 indicating that instruments inclined with research objectives. Further, the experts also helped in choosing the appropriate video for the particular lesson topic and assisted in setting learning achievement test questions based on learning outcomes. After setting the 35 learning achievements test questions, it was trialed on a different group of students in another class to check the reliability coefficient. The reliability coefficient of learning outcome test was .742 which on the reliability scale is categorized as acceptable (Andale, 2014).

To check the learning competency of both the experimental and the control group, pretest scores of both groups were compared using an independent

t-test (Shown in table 1). This independent t-test was chosen as a strategy to ensure both the control group and the experimental group were ability matched in social studies. The mean score of experimental group and control group was 7.13 and 8.84 with p>.05 which indicated that both groups were at a similar ability level in social studies before the treatment.

Table 1: Pretest between Experimental Group and Control on Social Studies Learning Achievement Test

Group	N	x	SD	t	df	Sig
Experimental Group	24	7.13	2.79	-1.96	47	.056
Control Group	25	8.84	3.31			

Data Analysis

A comparative statistical analysis was done using a Pair sample t-test to compare the pretest and posttest score within the sample group and Independent T-test between the groups to determine the effect of teaching through technology-based approach (Video clips and PowerPoint Presentation slides) on learning achievement of students in social studies.

To study the students' perception towards learning through technology based-approaches (Video clips and PowerPoint Presentation); descriptive analysis; as well as Mean and Standard deviation was employed.

To study the students' reports of their experience using technology-based teaching approaches (Video clips and PowerPoint Presentation) in social studies, a focus group discussion was conducted with the students group and the discussion data were analyzed using content analysis (Schreier, 2012) to derive themes which were then further categorized.

Table 2: Pair Sample t-test of Control Group on Pretest and Posttest of Social Studies Learning Achievement Test

Group	N	x	SD	t	df	Sig
Pretest	24	9.00	3.40	-5.43	24	.000
Posttest		12.64	3.95			

A Pair-samples t-test was conducted to compare the social studies learning achievement test scores of the control group. The resulted analysis indicated that there was a significant differences in mean scores of the control group's posttest (M=12.64, SD=3.95) and pretest(M=9.00, SD=3.40); t(24)= -5.43, p=.000 as shown in table 1. The result revealed that the social studies learning achievement scores increased as compared to the pretest values.

Table 3: Pair Sample t-test of Experimental Group on Pretest and Posttest of Social Studies Learning Achievement Test

Group	N	x	SD	t	df	Sig
Pretest	25	7.13	2.79	-10.22	23	.000
Posttest		16.75	4.87			

To compare the learning achievement test scores in social studies of the experimental group before the treatment and after the treatment, pretest and posttest analyses were performed using Paired-samples t-test. The result showed that there is a significant difference in the mean scores at posttest (M=16.75, SD=4.87) and pretest (M=7.13, SD=2.79); t(23)=-10.22, p=.000. The result suggested that teaching through technology based approaches does have a positive effect on students test scores achievement in social studies.

Table 4: Independent Sample t-test on Social Studies Learning Achievement Test between Experimental and Control Group

Group	N	x	SD	t	df	Sig
Experimental Group	24	9.04	5.27	4.22	47	.000
Control Group	25	3.76	3.32			

To compare the difference in social studies learning achievement test scores between experimental and control group, an independent t-test was employed. To determine the actual difference, the difference of students' pretest and posttest scores of both the control and experimental group was calculated. The result showed that there was a significant difference in mean scores of the experimental group (M=9.04, SD=5.27) and control group (M=3.76, SD=3.32); t (47) =4.22, p<.01. The results suggested the experimental group scored higher test scores than the control group after applying technology-based approaches as a means of instruction.

Table 5: Descriptive Statistics on Students Perception on Technology based Teaching Approaches

Items	$\underline{x}$	SD	Level of agreement
Enjoy Learning through technology based teaching approaches	4.75	.44	Strongly Agree
Learning through technology based teaching was more interesting and organized	4.92	.28	Strongly Agree
Understand the topic taught more easily through technology based teaching approach	4.21	.66	Agree
Learning through technology based teaching approach was boring and not interesting	1.33	1.01	Strongly Disagree
Learning through technology based teaching approach helps me learn social studies more meaningfully	4.58	.58	Strongly Agree
Feel motivated when learning through technology based teaching approach	4.67	.48	Strongly Agree

Table 5 showed the Descriptive analysis of students' perception on teaching and learning through technology-based approaches. The result revealed that students' perceptions on the implementation of the experiment were highly positive. The Mean of individual items were arrange from highest to lowest as following; 4.92 for learning through technology based teaching was more interesting and organized; 4.75 for Enjoy Learning through technology based teaching approaches; 4.67; 4.58 for learning through technology based teaching approach helps me learn social studies more meaningfully; 4.21 for Understand the topic taught more easily through technology based teaching approach and 1.33 for Learning through technology based teaching approach was boring and not interesting.

Focus Group Interview Analysis

The data collected through focus group interview generated two crucial themes.

Enjoyment

Students revealed that learning through technology-based teaching approaches helped them to enjoy their learning. For instance, one student said, "I enjoy learning through video clips and PowerPoint presentation slides because I could understand well and I could easily write notes". Another student mentioned, "I could understand more because learning was fun and interesting through watching video clips and PowerPoint presentation slides". These quotes, and volumes of positive feedback described above, suggest the effectiveness of using technology-based approaches in Bhutan is connected to students' enjoyment of the lesson taught and the delivery of the content in new and innovative ways.

Understand social studies

When asked about students' perception towards teaching through technology-based approaches, one of the respondents stated, "I like to learn through technology-based teaching approaches because I can understand well and it is interesting while learning through video clips and PowerPoint presentations". Another respondent said, "I like to learn through technology-based teaching approaches because it is fun, interesting and enjoyable, making me see through videos and diagrams". In addition, one of the students mentioned how they "wished teachers would teach us through technology-based teaching approaches all the time- as it is interesting and I can understand the topic taught more easily". The result clearly suggests that the Bhutanese students involved in the technology trail had a positive perception towards teaching and learning through technology-based approaches.

Discussion

The discussion was made under the following heading;

The Effect on Student Social Studies Learning Achievement Test Scores

The learning achievement test scores of the experimental group were found to be higher than the control group after the treatment was employed. The significant value was found at .01 which indicated that teaching through technology-based approaches positively improved the students' learning achievement test scores. The study finding affirms

the work of Isiaka (2007) and Champout (2005), who researched the usefulness of video media on achievement performance and found a positive effect. Similarly, in their study, Shah and Khan (2015) investigated the comparative effectiveness of multimedia-aided teaching (MAT) on students' academic achievement; although their field was science, it still revealed that technology-based teaching does have a positive impact on students' test scores.

Students' Perception of their Experience with Technology-based Teaching Approaches

The result from the students' questionnaire data strongly supported the use of technology as a teaching approach in Bhutan. The finding was in line with the study conducted by Abdullah, Muait and Ganefri (2019), they studied the students' perception towards modern technology as teaching aids and found students' held a highly favorable attitude to their implementation in their study conducted in Malaysia. Similarly, Kiyici (2018) study found that primary students have positive perception of technology use emphasizing both aspects of strength and weaknesses.

Themes Emerge from Teaching through Technology based Approach

Research studies have shown the use of technology in education increases students' motivation to learn (Jimoyiannis & Komis, 2007) by improving engagement and curiosity. In line with that finding, the first theme derived from the qualitative analysis was " enjoyment" indicating that students' enjoyed the lesson content taught through the use of technology as it motivated and made them understand the concept taught more easily. The study supported the earlier Ören and Meriç (2014) study of Seventh Grade students' perceptions of using concept cartoons in science and technology. They found the courses taught with concept cartoons were rated by students' as more pleasant/enjoyable and there was deep and long lasting learning in students who were taught this way. A second theme that came out from the focus group interview data's was students' understanding of the content taught was positively impacted as they reported how the approach helped them to visualize learning. The outcome of the current study supported the previous researchers who studied the use of ICT in teaching and learning and found that it does enhance the learning process by promoting active learning and maximizes the students' learning abilities (Ghavifekr & Rosdy, 2015; Young, 2003), helping students to understand the concept taught easily.

Conclusion

Research suggests that use of ICT as an instructional strategy increases academic achievement of learners (Badeleh & Sheela, 2011; Coates, Humphrey, Kane & Vachris, 2004; Ziden, Ismail, Spian, & Kumutha, 2011). Thus, the 21st century teaching and learning demands new strategies that could enhance three domains; cognitive, effective and psychomotor in the learners. In view of that, classroom teaching and learning must focus on maximizing learning competency through the application of various classroom pedagogies that best suit the learners. Unlike in western classrooms, Bhutanese classroom teaching and learning is mostly teacher centered with didactic instruction being the most prevalent instructional type. Replacing this approach with more modern methods of teaching and learning, like technology-based instruction may lead to improvements in learning outcomes. The use of technology-based teaching approaches is widely applied across the world and such application must be welcomed in Bhutanese context. The evidence from this small research study supports the use of technology-based approaches as a significant factor in students' learning achievement with strong support for technology-based learning.

Limitations and Recommendations

The current study focused only on Sixth Grade students and social studies subject at primary school level, so, it cannot be generalized to different grade students that use of technology based teaching can increase students' learning achievement. Therefore, future studies could be carried out including students of multiple grades and in different subjects, specifically in the Bhutanese classroom setting, as this may provide support for the use of technology-based teaching instruction in the classrooms in Bhutan.

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