Short Research Article

Strategies to encourage students' active participation through online teaching in mathematics

ABSTRACT

Online teaching and learning in the history of Bhutanese education system was not popular until the COVID19 pandemic hit the world since towards the end of December 2019 onwards and the desperate call for alternate ways of providing continued education to the children was highly felt. However, it was not an easy job to do for the teachers, students and parents as they lacked good knowledge, skills and attitude. In other words, they lacked required competency. Therefore, this short Research was done in a Middle Secondary School in Paro, Bhutan involving class X students as samples to find out the hindrances and to identify effective strategies that would encourage and motivate students actively participate in online lessons. The method used in this research is a quantitative approach. The data were collected through framed questionnaires, class test and personal interviews simultaneously. Questionnaires were given to the participants to gather authentic responses pertaining to the online classes. Video recording were done while interviewing the participants to have authentic interpretation pf the data collected. The triangulation of the data collected from the participants revealed that it is possible to have students participate actively in online lessons as they do in face to face classroom teaching and learning when proper strategies are implemented.

Key Words: Online teaching, online learning, hindrances, effective strategies, face to face classroom teaching, active participation

1. Introduction

The His Majesty the King of Bhutan Jigme Kheser Namgyal Wangchuck mentioned in one of his Royal Addresses (2019), "whatever situation may be, do not let the light of education ever go out. For if it should become dark, even for a moment, we will find that generations of our children will suffer its effects and the light on a bright future for our nation will take decades to shine again." Therefore, to ensure undiminishing light of education in the country amid the COVID19 pandemic, the educational institutions in the country had to immediately switch to online teaching and learning for the children since normal functioning of the schools got disrupted. However, it was not an easy task for everyone involved in such a sudden paradigm shift in teaching and learning particularly for the teachers, parents and children. It was a great challenge and thus this action research is about Khangkhu Middle Secondary school students' participation in an online teaching in the year 2020. The sole purpose of this action research is to investigate and then to implement effective strategies in order to ensure that students participate actively in online lessons. The thorough investigation on why students were not being responsible and delaying the submission of their online tasks gave us the opportunity to identify the most effective strategies.

With the ad-hoc closure of schools due to pandemic, COVID-19 pandemic, the normal teaching and learning process was ineptly affected; in order to keep students' engaged in productive and meaningful manner, online teaching started. It became the only means to keep in touch with academic learning of students but the responses from the students were not satisfactory. Therefore, it became inevitable that the proper strategies had to replace the current mode of teaching in order to make sure majority of the students responded to the tasks without much delay.

In the process of the online teaching we have learnt that the students are not taking the online classes seriously as some students failed to submit their assigned tasks on the scheduled time. According to Kleiman (2020), "active participation learning environment in an online classroom will translate into excellent experience for your students as well as for you. The connections made between your pupils and yourself will create lasting memories. It

involves changing the culture of the school, with new types of responsibilities for teachers, students and families, and new forms of interactions among them". This action research intends to create a culture that is going to be one of the effective methods for both the learners' and teachers' to interact and make the learners' as the active participants on the online classes.

2. Research Questions:

1. 1. What are some of the best strategies that can enhance students' active participation in online teaching?
2. What causes students' late responses in online teaching?

3. Reconnaissance

In Action Research, reconnaissance is a very crucial part to help researcher comprehensively understand the current status of the problem that needs to be addressed and to know the strengths and opportunities of the situations (enabling conditions) and to see the potential of the researcher. It is also to understand the enabling conditions and availability of resources for the smooth conduct of Action Research. In this study, I did the analysis of the following two very important factors.

A. situational Analysis:

Every problem has got at least a solution to it and with regard to the difficulties encountering in carrying out online classes effectively for the children of my school during the closure of school due to COVID19 pandemic, I could see some possibilities to deal effectively with the challenges. When I critically looked at the current situation of the way online classes being carried out by the teachers, the level of learners' participation and the support provided by the parents and guardians at home, there were some hiccups that could be addressed by carrying out action research and implementing some effective interventions generated from the findings.

The school is located in an urban setup where majority of the children live in town and developed villages nearby where most of the parents and guardians are educated. Internet connectivity is not an issue and moreover, Ministry of Education under the Royal Government of Bhutan has generously placed special consideration for the children's

continued education by providing free data packages to enable them to take active part in online classes. Majority of the children own educational gadgets such has smart phones, tabs, laptops, desktops that enable them for attending to online lessons. There are just handful of disadvantaged children where the school, District Education Office and the Ministry could easily handle them in facilitating online teaching and learning. The only thing that I foresee here is that, by collecting some baseline data on hindrances and possible effective strategies through action research, the challenges in children's weak participation and delayed responses in the online lessons could be easily addressed.

B. Competence of the Researcher

I have been in the teaching profession for the last 25 years and I have long rich experiences particularly in teaching. I have taught classes from primary through secondary and have dealt with all ages ranging from year five to as old as twenty-one years from very remote small schools to very large urban schools. Moreover, I had an opportunity to undergo a short study tour in Australia in 2002 where I was introduced to carrying out Action Research in Multi-grade teaching in the University of New England in New South Wales. I got very enriching hands on experiences to carry out action research on my day to day teaching of children trailing new ideas and skills in teaching strategies to promote meaningful learning for the children. I did action research on my multi-grade teaching practices in Australian schools, submitted the report on it and got published in the University's project reports.

When back to my country Bhutan, I practiced some of the ideas and skills grained from Australia trailing through action research. For this practice too, I submitted the report of my action research and got published in the University's project report as second phase of the Bhutanese teachers' attachment programme in Australia in multi-grade teaching through action research.

In 2014, I got an opportunity to pursue masters degree in Masters of Art in Leadership and Management in Lovely Professional University in Punjab, India under Government of India Scholarship. During my masters degree studies, I had a module on research methodology

and statistics in research and I had successfully done one dissertation as a partial fulfilment of my studies. Through all these experiential learning, I am confident to carry out action researches as well as conventional researches.

4. Literature Review

The review of literature is focused on the strategies of encouraging student's active participation in online teaching, identify the causes for delaying in responding on the given tasks. As per Morgan (2020), "many think that keeping students interested and motivated is as easy as following a formula, unfortunately, there is not a magic formula or a crystal ball that will help you motivate your students as each group and each class is different". Further Mason (1998), found that learners fall into three distinct groups in their online participation: "active participants, lurkers (those who read messages but do not post messages), and those who do not take part". Taylor (2002), "investigated students' participation patterns accessing and contributing to online discussions and whether these participation patterns influence academic achievement. He named the three groups he found: workers, proactive participation group; lurker's peripheral participation group; and shirkers, parsimonious participation group".

While Taylor (2002), "Proactive participation is one who actively take part in the discussions and response regularly, they show respect for teachers by being punctual, participating in lessons and working with limited direction. Proactive students include confidence, self-awareness and the ability to function as a team. They also show initiative, are able to make decisions and can solve problems. Whereas lurkers participated occasionally, but mostly in a "read-only mode". According to The Online Jargon Dictionary, the term "Lurker" is defined as: One of the "silently majority" in an electronic forum, one who posts occasionally or not at all but is known to read the group's postings regularly. Taylor (2002) identifies "one who contributed less than the average number of postings to the Discussion Board, but at the same time participated regularly in the discussion in 'read only' mode as a lurker. Furthermore, he classifies lurkers as belonging to "the peripheral participation Group" Shirkers performed the minimum required with fewer postings and irregular respondents".

Interestingly, in Bhutanese classroom too we came across those students who falls under above mentioned group. In fact, teachers are forced to remind them several times in class forum and most of the time we landed up calling students personally and encourage them to submit their assigned tasks on time. Despite several reminders, it is hard to get the positive responses from some of the learners.

However, experiencing almost six months online teaching, after the shutdown of the school, even though without contact teaching, we encountered with enthusiastic students who only needs proper instructions and well prepared lessons with authentic links. Without much monitoring and intervention, they carry out the tasks on their own in case of active participant groups. On other hand, we had different groups of students who always needed constant reminders and personal monitoring to participate and to get responses on time.

Hewitt (2001, 2003), "studied patterns of learners' responses and how discussions evolve over time. He argues that much discussion participation adopts the strategy of examining "unread" messages and pay comparatively little attention to older ones. He noted that growth patterns of participation owing to the abandonment of older messages may be a strategy for learners to cope with busy discussion conferences and information overload". Hewitt, further argued that the abandonment of older threads or messages can create changes in the topic. His studies are significant in understanding the influence of learners' participation habits on learning outcomes in order to effectively structure online discussions.

Learner participation is an essential element for active and engaged learning (Bloom, 1984; Chikering & Gamson.1987; Fleming, 1987). Learners may adopt new personas and may not feel obligation or pressured to participate in online communication when they do not see each other.(Palloff & Pratt,1999), In this article, the authors define participation as taking part and joining in a dialogue for engaged and active learning. Participation is more than the total number of student postings in a discussion forum. Understanding the issues that influence participation in the online environment is essential for effectively designing and facilitating online discussions.

4. RESEARCH METHODOLOGY

The study employed quantitative approach to collect the required data, i.e. under quantitative approach, data were collected through framed questionnaires, observation and follow up, class test and personal interviews simultaneously.

4.1. Data collection tools

In order to collect information or data, researcher used various tools such as questionnaires, interview questions, observations and follow up record sheets to make information/data more authentic. Depending on the nature of the information to be gathered, different instruments were used to conduct the assessment. As per Creswell (2003, p.19), quantitative data can be collected through different tools like class test and questionnaire. Upon collection of the data, the data were interpreted and analyzed through Microsoft excel and goggle sheet for the effective findings and conclusion.

4.2. Participants in the study

The secondary students of class X of my school were chosen. My school has classes ranging from pre-primary to ten. The participants were from class ten with 108 students. Both the genders were considered for our study. Anderson (2004), points out that "there is no rule for sample size in quantitative inquiry. Sample size depends on what you want to know, the purpose of the inquiry, what is at stake, what will be useful, what will have credibility and what can be done with available time and resources."

Participants were thoroughly brief about the questionnaire. Their anonymity for their participation was assured. After making sure that they had understood the research objectives, final consent was sought. Based on everyone's agreement to take part, appropriate time was and place was set up considering their conveniences.

4.3. Baseline data: Interview (Question and answer)

Before intervention we set questionnaires and conducted class test through online base on research topic. Their responses enabled to further develop questions to explore their

experiences and issues in online learning. These interviews helped to carry out immediate follow-up and clarification.

4.4. Intervention (action): Observation

Observation is another method that researcher can use to collect the data. Here the researcher becomes the participant and observe and noted down how things are going. We applied various strategies to see whether it affects the students on responding to the given tasks and participating actively. We did more than thrice. We observed it well when we were applying those strategies to see the changes of the students' attitude towards online classes. Observations records were maintained in the dairy.

4.5. Post intervention data: observation and survey

After the application of various interventions students were observed again. We wanted to see whether any change of improvement has taken place or not. when there were no changes or improvement, intervention period was extended and had to do more than three times.

4.6. Reliability and validity

Reliability and validity are considered as the strengths of quantitative research. To authenticate the validity and reliability of my research, I did the triangulation of the data by examining the evidences from the different sources of the research study. All ideas and points that the participants have provided were reflected and analyzed thoroughly. I made sure that participants were aware of their ideas and opinions were used properly in my study. I made sure that they were satisfied with this study.

5. Results

The collected data were further analyzed and interpreted in various forms of tables and graphs. The data were collected twice from the respondent before and after the research have been carried out, basically to find out the knowledge before the actual learning received during the class and after the class experiences. If I conclude the study without analyzing data, it would be an incomplete study. I organized and prepared the data for

analysis. I read through all the data that I have collected. Additionally, I have seen the differences between the data before and after applying various interventions. The below is the data collected in the form of pre-test and post-test, which was analyzed, interpreted, compared accordingly to get the end result.

1. I am satisfied with online lesson?

Table 1: satisfied with online lesson

Level of responses	Number of responses	
	Pre-test	Post-test
Strongly disagree	56	2
Disagree	30	5
Neutral	7	0
Agree	13	75
Strongly agree	2	26

6. Findings

After conducting short research on strategies for encouraging student's active participation through online teaching in mathematics, it came to a conclusion that it is possible to have students participate actively in online lesson as they do in face contact teaching when the following suitable and proper strategies are implemented.

To consider the satisfaction of the learners, we have to implement varieties of techniques to address the need of every individual. During the pre-survey stage, majority of the participants were skeptical about the online lessons, as a result they were not able to respond adequately.

To overcome the issues of the participants regarding the responses on online lessons, I started with finding out their pertinent issues, and we came to know that every individual has different issues regarding learning. In order to bring all the participants on-board, I tried implementing different strategies to meet their needs.

The very first thing was that I needed to create friendly and approachable environment for participants, so that they don't hesitate to contact the subject teachers whenever they needed help. On the other hand, the responses from the teacher should be prompt and precise. The prompt responses from the teacher really motivates the learners, they feel they

are important and cared for, which is directly proportional to their learning, as it also takes care of the timely submission of their assignments.

The assignment assigned to the students should be doable, in order to make them learn with ease, the lesson should be precise and tangible. The video lessons should be trimmed, so that only the required information is disseminated. The video lesson sent to them should be able to cater as the substitute for learning resources to some extent, whereby majority of the concept were learnt from the video lessons.

Parental involvement in students learning plays a vital role, with their involvement and supports makes learning accessible, especially with online lesson. With this short research, I can conclude that almost all the parents are supportive and positive towards their child's learning.

Through online lessons, participants were made to use varieties of software to respond to the assignment, when they were taught with variety of ways to answer the particular assignment, it boosts their interest to do the assignment. To make the online lesson effective and to ensure every participant takes active part, time to time interventions play pivotal role, otherwise the lesson becomes simply like watching movies.

With constant interventions and scaffoldings, participants gradually became independent and competent to operate and use different apps in order to search for helpful information, moreover the problem of late submissions or unresponsive participants were also able to submit the work on time.

Even though the online lessons were more challenging compared to contact teaching, instant corrections of their shortcoming is impossible but the more we interact with the participants, gradually we are able to communicate and point out their problems, it was tedious and consumes lots of time in the process of responding each and every bit of their problems and to cater everyone's need. All in all, it was worth at the end of the day as all participants could respond every activity on time with accuracy.

During the pre- survey stage participants were unable to distinguish which learning platforms were effective or user friendly, the reason being they are not used to with the new platforms. In order to get them familiarized and acquainted with the apps used for online learning, it is crucial to give them orientation before start of the major lessons. Once the participants were well acquainted with the apps used to deliver the lesson, the issue of turning in work has been resolved.

It can also be concluded that the model answers sent to them at the end of every assignment really helped them to relate their answers. This was one of the effective ways to exhibit the accuracy of their works as compared to model answers, and this also curved the issues of grading, if the assignment has to be graded, as they knew where individual's answers stand.

Finally, as a researcher I felt adult support and guidance play crucial role in their learning as they get diverted easily while attending the session online.

7. CONCLUSION

By carrying out this short research, it has given me an immense insight into the students' view on the online learning and the importance of individual teacher's involvement in every lesson taught. To ensure every participant takes active part in online lesson (mathematics), it is mandatory to know every individuals background, their belief on the subject matter, their interest as well. This help us connect with each and every individual learner, we could build a sense of belongingness, with strong interpersonal relationship. This was one of the prominent strategies which enable us to accomplish authentic outcome.

To have every participant take active involvement in every task and lesson, the lesson provider should ensure to give prompt responses whenever the learner encounters problem related to the lesson taught. Time to time interventions and scaffolding makes it more efficient for the learners to respond to the assigned task, more over the task becomes doable. Which in turn the outcomes are authentic.

Lastly to ensure the successful outcome, I felt proper and timely intervention, prompt responses, providing model answer scripts and fixing accountability to the learner for their

own growth in terms of learning are some of the indispensable methods to motivate. We are now aware that children learn through constant adult guidance and provide them with moral support at any time of their life.

Ethical Approval:

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

Disclaimer

In order to maintain confidentiality of the respondents, the identity of the respondents were not revealed in the course of study. As a researcher I never put my participants at risk and tried to falsify data in order to support our hypothesis. No manipulation of data and no biasness were done during the sample selection and the data interpretation. Informants were made to sign the consent form before the interviews. Creswell (2003) points out that "the researcher should develop and inform consent form for the participants to sign before they engage in the research". This research was carried out carefully and ethically.

Limitations

This action research was done with the senior most class (Class X) of the school and not taken into consideration of the lower classes where the online lessons are obviously much challenging.

School Management and other teachers, Parents and guardians were not involved in this research which otherwise would have been very comprehensive one.

This research was done within a very short period of time. The findings here would have been more realistic and authentic Had it done over a longer period of time.

In this study, the Action Research cycle implemented was very limited which otherwise should have been done lot more cycles to generate the maximum effective strategies for better conduct of online lessons.

Therefore, in future, all the above limitations of this Action Research can be taken up as strong recommendations for the future studies to have better research findings.

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