

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

ABSTRACT This Action Research was done in a Middle Secondary School in Paro, Bhutan involving class X students as samples to find out the hindrances to and to identify effective strategies that would encourage and motivate students to actively participate in online lessons. The main reason for the pressing need to carry out this action research was that, due to the COVID19 pandemic in the world, the normal education system got terribly affected and the educational institutions had no other choice than to immediately switch normal face to face teaching to online classes which has been a great challenge not only to the learners but also to the teachers and parents s due to limited knowledge and skills in this aspect. It became a challenge nightmare to everyone involved in it as there was great concern over ensuring continued meaningful engagement of learning for the children despite whatever situation may be in the world and within the country. The method used in this research is a quantitative approach blended with Maxwell's model of action research. The data were collected through framed questionnaires, class tests s and personal interviews simultaneously. Questionnaires were given to the participants to gather authentic responses pertaining to the online classes. Video recordings s were done while interviewing the participants to have authentic interpretation of 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 s as they do in contact teaching when proper strategies are implemented. However, this is just one very important aspect from the teachers' and learners' perspectives in making online lessons an effective and actively participatory one. While at the same time, it was realized that other very crucial factors such as parental guidance and support, home environment, socio-economic background and learners' own intrinsic motivation and interest also determine the effectiveness of online classes.

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 became go 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 a 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 that the 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

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seriously as some students failed to submit their assigned tasks on the scheduled time. According to Kleiman (2020, p.),

–“active participation learning environment in an online classroom will translate into an 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”.

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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.What is this in English??

In Action Research, reconnaissance is a very crucial part to help the 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.

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A. situational Analysis: Every problem has got at least a solution to it and with regard to the difficulties encountered ed ering in carrying out online classes effectively for the children of my school during the closure of the school due to the 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 the 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. The mMajority of the children own educational gadgets such has smart phones, tabs, laptops, desktops that enable them to for attending ing 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 gained 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, identifying the causes for the delaying in responding on the given tasks. As per Morgan(2020, p.), "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, p.), 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, p.), "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), mentions that "Proactive participation is one who actively takes part in the discussions and responds regularly, they shows respect for teachers by being punctual, participating in lessons and working with limited direction. Proactive students have include confidence, selfawareness and the ability to function as a team. They also show initiative, are able to make decisions and can solve problems. In contrast, 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 "silent 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, p.) 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

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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, p.), 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 briefed ed 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 ~~were~~as-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~~s~~ can use to collect the data. Here the researcher becomes the participant and observe~~s~~ and note~~s~~ed 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. Observation~~s~~ records were maintained in the dairy.

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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.

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4.7. Ethical consideration

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 ~~asked if they wanted~~ made to sign the consent form before the interviews. Creswell (2003, p.) points out that "the researcher should develop and inform~~ed~~ consent form for the participants to sign before they engage in the research". This research was carried out carefully and ethically.

4.8. Data analysis method 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 experience. If we conclude the study without analyzing data it will be an incomplete study. We organized and prepared the data for analysis. We read through all the data that we have collected. Additionally, we 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 5.

Findings/Recommendations After conducting action 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 contact teaching when 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, we 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, we tried implementing different strategies to meet their needs. The very first thing is we need to create friendly environment for participants, so that they don't hesitate to contact the subject teachers as and when 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 action research, we can conclude that almost all the parents are supportive and positive towards their child's learning. Through online lessons participants are 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 plays pivotal role, otherwise the lesson becomes 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 cures 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 plays crucial role in their learning as they get diverted easily while attending the session online.

6. CONCLUSION

By carrying out this action research, it has given us 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 participants takes active participation through 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.

After conducting this action research, we felt that online lessons can be effective as that of contact teaching, with the proper strategies in placed, on other hand unlike contact teaching, parent's involvement plays tremendous role in carrying out the assigned task without much hindrance. Lastly to ensure the successful outcome, we 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.

7. Limitations 7.1. This action research was done with the senior most class (Class X) of the school and not taking into consideration of the lower classes where the online lessons are obviously much more challenging.

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

7.3. This research was done within a very short period of time. The findings here would have been more realistic ?? (You mean valid and reliable) and authentic Had it done over a longer period of time.

7.4. 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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