TEACHING-LEARNING OF SCIENCE IN ONLINE MODE DURING COVID-19 LOCKDOWN IN RURAL SCHOOLS : PERSPECTIVES OF STAKEHOLDERS OF BOLGARH BLOCK OF ODISHA

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Over these years the world has explored many exciting opportunities with new technologies which have changed the trends and have brought people more closely with each other. Innovation has changed the manner in which individuals communicate and cooperate, it has set an open social platform that permits the occupants of this planet earth to interface with one another with ease bringing the whole world under one umbrella. COVID-19 has changed the approach of each sector and forced to change their preferences and needs. Education is one of the important sectors of the country. Looking at the difficulties and challenges faced in teaching-learning process during this period, Government of India as well as state governments are taking many initiatives. One of those initiatives is Odisha Siksha Sanjog launched by Government of Odisha. Based on qualitative design the present study collected data from parents, students and teachers and explores the perspectives of the stakeholders in rural areas on online teaching and learning, its benefits, challenges and possibilities.

Keywords: Online learning, online learning platforms, teaching science.

Introduction

Online learning or e-learning is a broad term used to allude to a type of learning in which the mentor and mentee are isolated by space or time but the two are connected using web advancements (Reshma, et al., 2017). India's education sector is being revolutionised by rapid increases in internet penetration. But in rural areas same traditional method is still in practice even in the e-learning era (Mukherjee, 2009). Many initiatives have been taken up by Government of India as well as state governments towards digital India (access, equity, and quality) and digital literacy in India, to facilitate the online mode of teaching and learning. Some of the initiatives are mentioned here.

- **National Digital Library of India (NDLI)**: It was propelled as a pilot venture in 2016, and is offering more than 2 million eBooks and others in excess of 100 dialects.

- **Swayam:** Free online education: It assembles courses educated in state funded schools from ninth class through to the post graduate level. The online courses incorporate four segments: videos, online readings and assets, self-appraisal tests, and open online forum.

- **Swayam Prabha:** It is a free educational channel providing educational contents 24x7 across the country. It covers the contents starting from Class I to higher

education classes including graduate, postgraduate, vocational and teacher training courses as well. It deals in science, arts, commerce, social sciences and humanities, engineering, technology, etc.

- **Diksha application**: Diksha makes it possible for the education ecosystem (Experts, Educationists, Organisations, Institutions-Government or Non-Government Organisations) to participate, contribute and leverage a common platform to achieve learning goals at a scale for the country.

- **Madhu app**: The app named after Utkal Gourab Madhusudan Das, has been developed in accordance with the 5T initiative of the state government of Odisha for school students on 3 December 2019. It is an e-learning smart phone application which will help the students of schools in the state to learn their lessons through tutorials and high-quality video lectures available in Odia language.

As the world is going through a very tough and unfavourable situation due to COVID-19 pandemic, and almost all the countries are under lockdown situation, each and every sector is affected including the education sector in India. To address these issues many initiatives are being taken care of by the Government of India as well as Government of Odisha to promote education through online platform amidst the lockdown. In the light of this, Government of Odisha launched Siksha Sanjog initiative on a pilot basis in Khordha district on 19 April 2020 and later it was extended in government-run schools across the state from 4 May 2020.

Need of the Study

E-learning arrived late in India obviously, yet it is by and large quickly acknowledged in a major way. India might have viewed the achievement of the west in embracing e-learning and is making a decent attempt to execute it (Imran, 2012). India has, of late, observed a flood in the selection of ICT based items and arrangements. Innovative works in this field have additionally observed upward trends. But the status of rural India in accordance to internet facilities and its benefits to rural India is still a question and needs to be answered.

Following are some reviews which state the use of online learning and its status in rural India.

Study directed by Abbasi, et al., (2020) found that students preferred classroom learning over e-learning. Dhawan (2020) in her examination concentrated on the web-based learning and the qualities, shortcomings, openings, and difficulties of e-learning modes in the hour of emergency. This article likewise throw some light on the development of EdTech Start-ups during the hour of pandemic and incorporates proposals for scholastic organisations on how to manage difficulties related to web-based learning. A study conducted by Baloran (2020) found that the respondents were happy with the administration's activity to moderate issues. However, reluctance with online-mixed learning approach was observed. Jadhav, et al. (2020) directed an examination on the students' role to look at problems in education system during lockdown issues in Maharashtra. The effect of lockdown on training has been referenced. Their points

of view on the online training during the lockdown and the outcomes were recorded. Jena (2020) studied the effect of COVID-19 on advanced education in India and has recorded some post COVID-19 patterns which may permit envisioning another method of showing learning of advanced education in India. Manazir, et al. (2020) led an investigation to see how to make e-learning more fruitful under the current circumstance and if an ever-comparable circumstance comes up in future. They found inclination for 'WhatsApp' and 'Zoom' platforms for video conferencing. Reshma et al. (2017) in their investigation expressed that there are a few innovations accessible to empower different audience today. Two such developing innovations which have extraordinary potential for e-learning in rural India are the Next Generation Internet and Natural Language Interfaces. Both these advancements are still at a beginning phase both in India and abroad. Be that as it may, our industry and policymakers can exploit these innovations and use them to serve the country. As per the investigation conducted by Yadav and Tiwari (2016) improvement of any general public relies on its access to data and the same is relevant to India as well. E-learning can do some incredible things toward this path and help the socially minimised network to achieve their qualifications. Patel, et al. (2014) in their investigation found that utilizing e-Learning Tools one can enormously improve learning process and procure learning in simple issue-free condition. Another significant advantage of the e-learning is that one can make adapting consistently on. Aggrawal (2009) pointed out the social ramifications of web-based learning. A summary of the studies discussed is provided below:

1. E-learning tools can be utilised enormously to improve learning process.

2. E-learning can do something amazing and help the socially unprivileged community to accomplish their privileges.

3. The main constraints to access e-learning facility among rural people are network problems, discomfort ability, lack of technical knowledge, etc.

Because of the lockdown, online teaching and learning is a matter of concern. There is a need to study the status of online mode of teaching-learning in rural Odisha. From the above discussion, it can be concluded that a lot of work has happened in the area of online learning. However, a lot is yet to be explored and researched upon. In this analysis, the researcher aimed to illustrate the perspectives of different stakeholders on online method of teaching and learning.

Operational Definitions

Online mode of teaching-learning: In general, online mode of teaching and learning is an acquisition of knowledge through different online modes. But for the present study the online mode is defined as using WhatsApp as an online medium of teaching.

Stakeholders: Stakeholders in educational process may include administrators, principals, teachers, counsellors, parents, students, etc. For the present study, stakeholders include teachers, parents and students.

Research Questions

1. What are the online resources and programmes available from school education department for teaching-learning of science in rural Odisha?

2. What are the perspectives of the stakeholders related to implementation and challenges in using online resources during this lockdown?

Delimitations of the study: The study was conducted in one of the blocks of Odisha, i.e. Bolgarh block of Khordha district. Ten teachers, ten parents and ten students each from primary and secondary schools have been taken into account to generalise the findings.

Methods and Procedure

Research design: For the present study descriptive research approach was followed to collect data by using a self-constructed interview schedule.

Population: The targeted populations for the study were the government school teachers teaching science in primary and secondary schools of Bolgarh block, the parents of the students who are studying in those schools and the students of Bolgarh block studying in primary and secondary schools. In Khordha district there are six blocks. One of the blocks is Bolgarh which includes 16 clusters. Total numbers of schools coming under the Bolgarh block is 205 including primary, elementary and secondary schools.

Samples and sampling procedure: Convenience sampling method was used which is a type of non-probability sampling. For the present study 20 teachers (ten from each: teachers of primary and secondary schools), 20 parents (ten from each: parents of primary and secondary school students), 20 students (ten from each: primary school and secondary school students) were selected as participants (Table 1).

Data collection procedure: The period for data collection lasted for almost fifteen days. Face-to-face as well as telephonic mode of interview between the researcher and the participants were employed to collect detailed information about their experiences of online mode of teaching and learning using WhatsApp. The whole process of interview was recorded by using an audio recorder for precise transcription and the researcher noted the valuable and important points provided by the participants. During the face-to-face interview, all the Covid-19 guidelines were followed.

Findings of the Study

The information gathered by both recorded and composed structures were translated and classified based on the reactions of the

Table 1: Participants for the present study

Teachers (20)		Parents (20)		Students (20)	
Upper Primary	Secondary	Upper Primary	Secondary	Upper Primary	Secondary
10	10	10	10	10	10

members to each questions. The reactions were then classified into topics and sub subjects.

1. Online Resources Used for Teaching and Learning during Lockdown

About Odisha Siksha Sanjog

A programme of Government of Odisha to impart teaching and learning during the lockdown period due to Covid-19, Odisha Siksha Sanjog emphasises on online learning through WhatsApp. This was continued for six weeks till 13 June 2020. WhatsApp groups have been formed at different levels starting from DEO to students for sharing the following materials:

- PDF of parts of reading material accessible in OSEPA site.

- Question bank (containing inquiries of various qualities, i.e., 3-mark, 2-mark, 1 imprint and so forth) model answers/ answer keys.

- Teaching material for every exercise/ period comprising exercise content worksheet and answer key.

- Written clarification arranged by educators, video chronicles or sounds cuts arranged by instructors, video exercises/movement recordings accessible in Madhu App, Diksha Portal or other comparative locales/ computerised stage might be utilised as exercise content.

- Worksheets of Ujjwal and Utthan for rudimentary classes can be utilized.

Teachers' Perspectives: All the participants were of the same view that under the Odisha Shiksha Sanjog programme, they have been teaching through WhatsApp. When the teachers were asked about the other platforms or applications they are using for the teaching and learning, teacher participants 7, 9 and 17 stated about the Madhu app. But they are not using it. Teacher participants 12, 15, 18 and 19 stated about the Diksha app and ePathshala. They referred to the contents at times.

Parents' Perspectives: All the participants stated that, they heard about the online teaching from the class teachers when they called and asked about their WhatsApp number.

Parent participant 3 stated "Sir called me and told to give the WhatsApp number. I don't even know about WhatsApp. I asked the teacher what it was and then he made me understand. When I told him that I don't have a WhatsApp number and mobile also, then he told to ask my elder daughter (sir knew her as an old student). Then I asked her and gave her number".

Parent participants 11 and 14 stated "Sir called and asked for the WhatsApp number. We had mobile phones but don't have WhatsApp. Sir told how to install it. Then we installed and gave the number".

Students' Perspectives: When asked them, they told their teachers used to send questions in WhatsApp and they used to send answers back to them.

2. Use of WhatsApp as a Platform or Medium of Interaction

Teachers' Perspectives: During the interaction all the teachers stated that they get questions from the Cluster Resource Centre Coordinator (CRCC). They stated that

"we have a WhatsApp group, questions are made by the subject-wise resource person at the district level, and they send the subject and class-wise questions and materials to Block Resource Centre Coordinator (BRCC). BRCC sends the materials to CRCC. We get the materials in the previous day evening; and we send those materials during the fixed time tables (8 am-11 am for primary classes and 8 am-12 am for Classes IX and X) and students were asked to send answers back to us. In the same day evening, we send the answer sheet, so that students can self-evaluate".

When they were asked whether the materials sent by the resource persons are sufficient or not, all the teachers were of the same view that the materials provided by them are not enough.

Teacher participant 5 stated "sometimes I used to make some questions and send to students", and all others stated. "Although we have instructions that we can make if we wish to but looking at the students' problems we don't generally give, but if any students asks anything then we answer them".

Teacher participants 13 and 16 told we don't have any other option than sending the materials.

Parents' Perspectives: Parent participants 3, 5, 14, 17, and 18 stated that, we don't know much. But when sometimes we ask them, they told sir and madam are sending questions in WhatsApp and we answer them.

Students' Perspectives: Our teachers used to send the questions and we answer them. In the evening, when teachers send the answers we match the answers with our answers.

3. Attendance of Students

Teachers' Perspectives: When asked about 'whether all the students attend the class' all the teachers replied maximum numbers of students were not attending. Only 30-40 per cent of students of the class have WhatsApp number of their parents. Some of them have also given their neighbour's number, uncle's number, etc., and the number of students decreased in the lower classes. However, two teacher participants 2 and 6 also told that "we also didn't have WhatsApp, now we also installed it".

Teacher participants 13 and 14 belonging to the same secondary school stated that some of their old alumni students who are in higher positions donated seven mobile phones to the needy and talented students.

Parents' Perspectives: Out of the 20 parent participants, 13 have phones (parent participant no.1, 2, 4, 6, 8, 9, 10, 11, 13, 14, 16, 17, 20) out of which seven parent participants have smart phones (parent participant no.2, 4, 6, 9, 11, 16, 17), while four of them were not using WhatsApp (parent participants 4, 9, 11, 14). Other seven parent participants 3, 5, 7, 12, 15, 18, 19 have arranged for smart phones from their elder son or daughter or from their neighbours.

Students' Perspectives: Out of the twenty student participants, three student participants 4, 13, 18 of Class IX do not have any access to mobile phones and others have somehow arranged and are attending the classes.

4. Response from the students in online learning

Teachers' Perspectives: Out of 30-40 per cent students who have WhatsApp number of their parents, almost 50 per cent used to send back the responses. Teacher participant 3 stated "we also don't know whether they are sending or someone else like elder brothers

or sisters are answering so that they don't have to sacrifice their phone for their younger brothers or sisters' study purpose. But we are trying our best to monitor." Other teacher participants like 12 and 19 stated the same thing.

Parents' Perspectives: Some parent participants who are having their own mobile phones told "our children must be sending as they are using the mobile phones for study purposes". Two parent participants 2 and 6 told, "Yes they are sending and we are monitoring". Parent participants 3, 15, 18, 19 stated "sir, getting others' phone every day is very difficult as they have their own works". Parent participant 1 told "sir, I have a small child, giving her mobile is a very difficult job as she may break it." So I am not giving, when I am free, I used to sit with her and give her mobile."

Students' Perspectives: Except student participants 4 and 13, who are siblings, others told "yes we used to response to our teachers' questions". And student participants 4 and 13 replied "Sir, we don't have mobile phone, we sometimes go to my friend's house, asked him/her what question sir has given, I answered them from his mobile in my name. But every day it is not possible."

5. Implications of online learning

Teachers' Perspectives: According to the teachers, it is useful for the students as they are engaged in certain academic activities. "Something is better than nothing," teacher participant 5 stated. At least some students take it as a burden that some work has been assigned and we have to complete.

All teachers also told that "it is also helpful for us as it is making us more conversant with technology, before we were not using".

Parents' Perspectives: "It's better to read something," they stated, "otherwise they are not even looking at their books."

Students' Perspective: Five secondary school student participants 8, 10, 12, 13, 16 told, "Although it is difficult to connect, but at least we could ask doubts to our teachers. At least we get some guidance from the teachers."

6. Challenges of Teaching-learning of Science through WhatsApp in Rural Areas

Teachers' Perspectives: All the teachers agreed and stated the following points. Each and every parent can't afford to have a mobile phone and they are hesitant to ask for mobiles to their neighbours regularly. Secondary science teacher participants 9 and 20 stated "teaching science through WhatsApp is not at all sufficient. There are many complex concepts in Class VIII and Class IX; it is very difficult to teach these concepts through WhatsApp. We don't even know that students are getting anything or not." All other teachers agreed to this point. Secondary school teacher participants 5, 9, 10, 11, 17 also stated that, "Parents don't want to give mobiles to the children as they were misusing it, and if they are also not given for longer times, it is difficult if sometimes we want to call and make them understand the complex concepts". Secondary school teacher participant 9 specifically stated that "our HM called one student and scolded him for uploading status in WhatsApp during the class."

Teacher participant 1 stated "as face to face mode of teaching is not there, so students are casual as they know that teachers will not say anything, if they don't do the assigned tasks." Other teachers also agreed upon the same issue.

Teacher participants 1, 2, 7, 10, 13, 16, 17, 19 stated "Interaction and communication with students is difficult, as calling each student is next to impossible work as they don't have their own mobile phones but we are trying." Primary teacher participant 2 stated "it's difficult to teach through WhatsApp to junior classes like Classes II and III, as they cannot even read clearly. So their parents have to help them in reading out the questions for them, some parents who have time are doing it, but some other parents are illiterate."

Teacher participants 3 and 5 stated "Network problems and money are the constraints for them. Every parent cannot avail the internet facilities as it is costly. Sometimes if they want to recharge also, due to lockdown it's a difficult task." All teachers agreed upon "Attendance of students is the major issue. Students who don't attend the classes, they miss and it's difficult to go at the pace in the next class and they don't understand the science concepts." Teacher participants 1, 11 and 15 stated "In some schools there are Classes up to V, VII or VIII. The pass out students from these schools could not get admission to the next class and for which they were debarred from the online mode of teaching." Teacher participants 3, 7, 9, 12, 13, 16 stated "Books were also not been provided for the next class to which students were promoted, and as they are having the issues related to mobile phones and networks, etc. it is not possible for them to access the internet facilities and download the e-Books and video tutorials."

Parents' Perspectives: Unavailability of smart phone with each and every parent is the major issue. Parent participants 5 and 7, 12 and 18 stated "we don't like to ask for

mobile phones to our neighbours daily." Parent participants 1, 4, 6, 10, 17 and 20 stated "Children use the mobile phones for other works rather than study, they used to play games, watch videos, etc."

Students' Perspectives: Student participants 4, 7, 11, 13, 14 and 18 told "I don't have a mobile phone, many of our friends also don't have mobile phones. Learning through WhatsApp is not at all sufficient; we don't get everything teachers want us to understand. The complex and critical concepts are hard to understand. Generally, our teachers write the things on some papers and send us. We sometimes get, otherwise we ask. Sometimes our teachers make us understand over phone if we have doubt. But as all of us don't have any mobile phones and every time it is difficult for us to clear our doubts."

7. Possibilities

Teachers' Perspectives: All the teachers stated about follow up, monitoring as well as awareness to parents. It is much more important as parents only can guide their children. In this problematic situation, parents' role is more important. Initiatives from government and NGOs towards these needy students can also be helpful. Help from the old students also can be helpful.

Parents' Perspectives: Parent participants 2 and 6 stated that "role and responsibilities of parents are more. We have to monitor and guide our children. Then it can be more successful." Other parents also agreed on that point that they have to monitor their own wards.

Students' Perspectives: Student participants 6, 9, 10 stated, "If government gives one mobile phone to each student as they are

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giving bicycles, it will be helpful. Because we don't have mobile phones, so we cannot use them for studying." Student participant 19 and 20 told "some of the old students have contributed some mobiles for us. We are thankful to them."

Online platform in rural areas of Odisha in Teaching and Learning Science.

The interaction and discussion with the teachers, parents as well as students helped to project the ground reality about the status of online mode of teaching and learning and its need for people residing in the rural areas. From the above discussion the following points can be agreed upon:

(a) Mostly the e-learning initiatives deployed so far are at basic level and is more traditional in nature.

(b) The way education has been dealt since ages — the same practice is going on even in the e-learning era.

(c) Merely a change in medium has taken place without considering any change in pedagogy or delivery objective.

(d) Rural people were not aware about the online platform of reading. Many people thought of only the negative impacts as they had been listening from different sources.

(e) Teachers of the rural areas are not conversant with the use of ICT and its use in teaching-learning processes, so they need to be trained to update their knowledge about online teaching-learning, use of ICT in their practices.

And they can also further make parents aware as well.

(f) There were numerous penniless students in rustic zones that are being deprived of the online instruction.

Discussion of Results

The present study projects the perspectives of different stakeholders on online mode of teaching and learning in rural schools of Bolgarh block of Odisha. Based on the findings, it was realised that people of rural areas were not conversant with the online mode of teaching and learning and e-learning in the rural areas is still in the basic level. Mukherjee (2009) in his study also agreed and stated that in rural areas same traditional method is still in practice even in the e-learning era. However, it was realized that in the lockdown situation, where movement is strictly prohibited, e-learning has come in to practice. Patel, et al. (2014) in their study stated that e-learning is something which can make learning ON anytime. And the present study also agreed to the point stated as online education has become one of the alternatives to continue the teaching-learning. Manazir, et al. (2020) in their study also tried to understand the success of online platforms during this period and has suggested different platforms like WhatsApp and Zoom for online study. So, online mode can be used for teaching and learning as it will help in the development of the country and will be a step forward in the digital India initiative. The present study is about using WhatsApp (as part of *Siksha Sanjog* initiative) as a platform for teaching and learning. In addition to Zoom and Google meet, WhatsApp also can be used

as a medium for online interaction. Yadav and Tiwari (2016) in their examination expressed about the importance of digitalisation and utilisation of data and correspondence advances for the improvement of the nation. It has been understood that there are several issues for the moderate digitalization in rustic zones. Similar problems and negative factors which were influencing the progress of the country were cited by Reshma, et al. (2017). The present study found that the unavailability of resources, poor financial conditions of people and very minimum awareness about the online mode of teaching and learning slows the online teaching and learning process as well as the digitalisation process. Dhawan (2020) in her investigation concentrated on the web-based learning and the qualities, shortcomings, openings, and difficulties of e-learning modes in the hour of emergency has likewise recorded numerous advantages, difficulties and opportunities of online stages. Online mode of learning has been an alternative in this critical and unprecedented situation. The present study also discussed about the benefits, challenges and possibilities of online mode of teaching and learning, and mainly discussed the use of WhatsApp as a learning platform. Jena (2020) has additionally recorded some post COVID-19 patterns which may permit envisioning another method of showing learning of advanced education in India. From this study, we learned that teachers and students feel face-to-face method of interaction to be better than the online mode despite the fact that they acknowledged the online method of learning. The present study discussed about some possibilities like prioritizing the

awareness, training and monitoring about the use of different platforms. Abbasi, et al. (2020) in their investigation likewise found that students do not have inclination for e-learning and prefer face-to-face learning. The present study also agreed about the fact that they face less challenges in face to face mode of teaching and learning as compared to online learning when their understanding about the complex concepts is taken into account. Also, the unavailability of smart phones with many students also affects their learning.

Conclusion

The present study focused on the perspectives of different stakeholders on online mode of teaching and learning in rural areas. After going through all the discussions, it can be concluded that rural area is developing but in a very slow pace. Teaching-learning of science through online mode during COVID-19 is very much tough in higher classes as there are many complex concepts. Government needs to see and focus on the ground reality during formulating any guidelines or taking any initiatives. Still it can be concluded from the above findings that Odisha Shiksha Sanjog, although could not cater the needs of all the students, but it is a welcoming step towards educating students in the unfavourable situations. The government should make strategies to address the challenges and take certain steps for the benefit of the people and the society as a whole. Monitoring at district, block and cluster level will be more helpful for online learning.

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