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High School Students Biology Learning Loss During Covid 19 Induced School Closures

Dr. Swati Srivastava

Assistant Professor Department of Education Pragati College Raipur Chhattisgarh, Email : swatikhare2002@gmail.com

Abstract

The study aimed at exploring biology learning loss among high school students of Raipur district of Chhattisgarh during COVID 19 induced school closures ,through biology teachers practices, issues raised ,action taken and their endeavours to support learning in students. Data was collected from 30 biology teachers (25 female ,5 male) selected through non probability targeted sampling technique from 20 private and 10 Government schools. Data was analysed using inductive coding process. Findings revealed learning loss due to differences in instructional delivery pertaining to inequalities among the schools and students socio economic status. Lack of motivation in students ,limited methods to teach practical aspects and parental attitude accounted for biology learning loss.

Keywords Learning loss, school closure, covid-19, biology, high school students.

Introduction

Learning during Covid19 induced school closure.

Emergence of viral pneumonia in Wuhan ,China, at the end of December 2019 marks the onset of deadly pandemic. Beginning of year 2020 witnessed the wide spread of covid19 taking the entire world into its cruel clutches , affecting the lives in most unexpected ways, countries imposing restrictions in the form of lockdown, closure of schools, colleges ,shops ,malls laying ban on mass gatherings disrupting all essential services so as to reduce the chances of transmitting the deadly virus. School closure due to covid19 pandemic raised the issue of paradigm shift from offline to online and at home learning(Madeline,2020). School closure result in learning disruption, limited access to learning facilities such as laboratories (Oneyma & Eucheria, 2020), presentation of content and laboratory activities un-implementable (Funa & Talaue, 2021), negative impact on learning ,interaction with peers and instructors (Supriya et.al 2021). There had been complex demands of emerging distance education for crafting productive pedagogies (Funa & Talaue, 2021). The school role in equalizing educational prospects for students reduced during covid19 pandemic (Andrew et al, 2020) resulting in increase in learning gap between students from higher socioeconomic status and low social economics status (Akmal & Pritchett, 2021; Van Lancker & Parolin, 2020). Students belonging to low social economics status lack access to all or maximum of educational opportunities during lockdown. There were students with limited or no access to e-learning resources. Inadequate learning support and activities and dearth of access to technology resulted in learning loss (Dabates et al, 2021). Absence of learning due to school closure and forgotten learning (Sabates et al ,2021) is crucial for having long term effects on students societal involvement (Andrew et al, 2020; Tomasik et al, 2020). Covid19 has adverse effect on education due to loss of contact ours and lack of e-learning facilities (Sintema,2020). Do it yourself , open technology ,smartphone based instrument and simulation ,online video material helped during school closure (Abriata, 2021). Various e-learning platforms like DIKSHA (Digital Infrastructure for Knowledge Sharing), NROER (National Repository of Open Educational Resources) & Swayam Prabha are offered by Government for studies (Mishra & Dangwa, 2019; Anushalalitha, 2020; Mishra et al,

2020; Sharma et al, 2020). During covid19 pandemic there has been a Paradise shift from offline to online mode of education (Kumar et al , 2020). E learning emerged to provide education over long distances (Singh et al, 2020). However digital learning may not be that effective as the learning during physical class instruction (Di Pietro et al, 2020).

It was assumed that covid 19 pandemic lead paradigm shift to online teaching would have negative effects on biology learning practical aspects. This assumption was based on multiple factors including the chances of instructors not making optimal use of technology resources in providing online instructions (Di Pietro et al 2020; Schleicher, 2020). School students dealt with various ecological ,electronic and mental challenges (Garg et al,2020).

Lack of in class instruction and physical instruction between students and teachers results in development of feeling of isolation in students .To tackle this, school should offer other forms of interaction among students and teachers (Barteit et al, 2019). Family environment (Andrew et al, 2020; Tomasik et al, 2020) and learning styles, motivation (Tomasik et al,2020) influence learning during school closure. Despite of e-learning resources, learning loss was anticipated (Wyse, et al, 2020). Students learning had been affected due to learning differently, with or without technology (Middleton , 2020). Learning loss would be having long lasting effect in future (Tomasik et al, 2020 ;Andrew et al, 2020).

Remote teaching in Chhattisgarh

In view of alarming rise in corona virus cases in India, Chhattisgarh government declared holidays in schools from 12th March 2020 till further orders as a precautionary measure.Covid19 pandemic caused a severe learning loss in Chhattisgarh (Annual Status of Education report, 2021). As per the report, percent of students failing to identify alphabets in pre-primary classes doubled in 2021 as compared to that in 2018. This report is generated on the basis of survey of 45,992 students belonging to 8 group 3 to 16 years from 28 districts .This could be assigned to the fact that real time implementation for practical knowledge is negligible in e-learning (Garg et al, 2020). To curb down the expanding cases, Government of India declared complete locked down across the states so as to break the chain of spread (Jha et al, 2020; Upadhayay et al, 2020).

Efforts to reduce the pace of covid 19 spread through alternative mediation have evoked the closure of education institutes across the globe (UNESCO 2020).

School practices during closure

Teachers aimed at developing strategies according to the learning needs of students (Kim & Asbury, 2020). Online teaching encountered concerns such as limited access to e-learning resources ,poor motivation ,self regulation and inadequacy of learning assessment (Al per, 2020; Ozdogen & Berkant, 2020).

The study

Several studies on teachers role and application during school closure revealed that students faced challenges in availing the learning opportunities, thus resulting in learning loss that was already assumed. The present study aimed to investigate the high school students learning loss in biology during school closure through government and private school biology teachers role, efforts and practices to ensure learning in students. It was assumed that learning loss could be due to difference in socio economic status of students and social factors like gender discrimination.

Research Questions

Q1. How did teachers ensured students biology learning during school closure ?

Q2. What factors affected teachers teaching ,support and biology learning loss in students ?

School closures in Chhattisgarh continued until january 22 and the study focused on the school closure across all the waves of Covid19 and assumed that the learning loss continued throughout.

Methodology

As the study aimed to investigate the biology learning laws from teachers perspective, phenomenology (Creswell & Poth, 2018) has been used. The study focused on the instructional methods during online classes and factors affecting the teaching, to reduce learning loss so as to unveil the underlying reasons for biology learning loss in students.

Participants

The present study was conducted in April 2022 on 30 biology teachers (25 female, 5 male) selected through non probability target sampling technique, teaching in High school (grade 9 - 10, 15 to 17 age group students) at private (N=20)and Government (N=10)schools of Raipur district of Chhattisgarh. Majority of government teachers were teaching in schools where most of the students were of low social economic status having limited or no access to resources. whereas private school teachers were from schools with students from high socio economic status having access to e learning resources and advanced technology as well as supportive home environment. All the participant teachers were having more than 5 years of teaching experience.

Data collection

Data were collected within the qualitative research framework through open ended questionnaire and related follow up to explore the teachers experience in order to comprehend learning loss questionnaire was created as a Google form that was sent to teachers through Whatsapp and email. Face validity of questionnaire was established by showing it to 2 experts. Participants were briefed about the purpose of the study prior to data collection.

Data analysis

Data analysis was done using inductive coding (Miller et al, 2014). Coding of forms was done and data analysed using content analysis that is systematic analysis of data (Cohen et al, 2007,; Fraenkel et al, 2012).

Findings

Data analysis showed the difference similarities and teachers support in government and private school

- **Teachers facilitating students learning**

Government school practices

Majority of students of government school where from low socio economic status having less or almost no access to internet and any technology. First few weeks of school closure went in vague wondering how to carry out lessons, particularly practicals.

All the class teachers formed Whatsapp groups with students having smartphones and those who had no phone their parents were added to the group. Teachers joined the group of other classes also in which they taught. Teachers thought using Whatsapp by sending explanation through voice records, video records Whatsapp messages or photo file. Students in turn responded by sending solutions back to teachers. However, some students failed to maintain this two way communication.

Chhattisgarh Government initiatives

To overcome digital divide, Chhattisgarh government launched various innovative schemes such as padhaai tumhar dwar in which 2 lakh teachers and 20 lakh students were associated with Android app for online education. Teachers uploaded about 18184 video lessons and 914 audio lessons. Mohalla class and loudspeaker school were carried out at village level. The students lacking smartphone and network access were provided audio lectures through bluetooth to their guardians. Despite of all these efforts, monitoring and assessment of biology learning was not easy for teachers. Even during online synchronous classes teachers fail to get response from the wards and could not keep an eye on their work. Most of the teachers reported that they could not send video lessons because most of the students could not watch them.

Private school practices

Private schools were offering online classes using learning management system specifically Google classrooms. Teachers also used various video conferencing apps like meat zoom teams to facilitate learning. Teachers prepared PowerPoint presentation with animations to teach the concept and simulations to comprehend the practical aspects. Students attendance in synchronous class was taken through software enabled conference apps .Assignments and projects were given using learning management system and were collected the same way. Despite all these efforts it didn't work out in practical aspect because of lack of motivation spirit and cooperation. Not all students followed the instructions and only few

completed the given task. Even assignments completed were fake writing irrelevant things.

Issues raised and action taken

Lack of accessibility to classroom environment and communication with pears where the major issues confronted during school closer masking the learning opportunities provided in in person classroom environment. Most of the teachers came out with a view that students were not raising any question on lessons taught to them that they normally did during normal classrooms. Lack of effective communication between teachers student adversely affected motivation level. Being not able to observe all the students during synchronous class also is a major factor affecting learning.

Factors affecting learning loss in biology

Inequalities among students, lack of physical interactive learning environment ,students less participation and anticipated difficulties such as no access to smartphone and other e-Learning resources, improper network connectivity ,lack of motivation ,limitation of methods to teach practical lessons in bio as all students do not have access to simulations are major issues resulting in learning loss

Practicals involve 3D aspects and it is not possible via photo file or through pen-paper activities in online classes. Lack of interaction along with technology handicap had adverse effect on biology teaching pedagogical practices in online classes. Teachers could not use interactive instructional methodologies as students were not active during class. Majority of the students just remain logged in, putting their microphone and video in off mode. Whereas during in person classroom teaching, teacher facilitated learning by creating and nurturing curiosity and motivating students to raise and ask questions.

Discussion and Conclusion

High school biology teachers account reveal the main reason for biology learning laws being difference in socio economic status, digital divide, no or limited access to e-Learning resources, teachers and condusive learning environment. Although Chhattisgarh Government launched various schemes and took initiative to engage students in teaching learning practices but various factors like socioeconomic status, motivation, inequalities and access to e learning resource were crucial. Home learning environment is important when students are not learning at school (Andrew et al, 2020; Sabates et al, 2021). Parents not taking interest resulted in students bunking synchronous classes and not doing assignment thus leading to learning loss in students of low social economic status (Andrew et al, 2020; Tomasik et al, 2020).

Classes requiring hands on lab components should be kept in person (Dione et al, 2022). Students rated online courses more negatively then in person courses. Field trip in biology is menaced by corona pandemic (Titus et al, 2022). Students experienced difficulty in understanding material, lack of concentration, boredom and flickering internet connectivity(Damyanti, 2022), loss of reduced interaction and collaborative activities among students (Beltz et al, 2016).

School closure result in learning description limited access to learning facilities such as lab (Oneyma, 2020), presentation of content and laboratory activities unimplementable (Funa et al, 2021).

Educational technology will be more accessible in learning context, providing a supportive environment (Verulova et al, 2021). The interest in learning biology online during corona is low (Gustia, 2021).

Lack of learning supporting and access to technology resulted in learning loss (Sabates et al, 2020). Adaptive process are slow in online learning resulting in loss of productive time (Begum .et al, 2021).

Compensating learning loss resulting from school closure is difficult due to overloaded curriculum (Kaffenberger & Pritchett, 2021).

The study unveiled the various underlying and interlinked factors that influenced biology learning in students during school closure.

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