# Use of Digital Tools to Enhance Student Engagement in Online Teaching: An Action Research Study

**Running Title:** Use of Digital Tools to Enhance Student Engagement in Online Teaching: An Action Research Study

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**Abstract**

Restrictions everywhere due to Covid-19 had compelled education institutions to rapidly embrace digital tools to support teaching and learning. While logistically, the use of digital tools offers an instant solution but one needs to look into these methods,largely how students engage and learn in these digital spaces.

During the pandemic, the inservice and preservice teachers were not prepared to teach in the online mode. Inadequate facilities and resources for engaging students in online environments seems to pose a greater concern for teachers. Various quick arrangements were made by the school authorities to gear up the teachers to engage online learners. Thisstudy reports on an action research study on pre service and in service teachers' preparedness to utilize various digital tools such as G Suite applications, Zoom and Google Classroom to foster student engagement in online teaching.Provisions by the administration of the institutes they are linked to in proving appropriate measures to learn the usage of online platforms.

The study made several recommendations regarding the affordances of these tools and the teachers using it.

**Keywords-**Online learning, Digitaltools, Pré service and Inservice teachers

## Introduction

The spread of the novel coronavirus Covid 19 has led to profound changes in the education sector (Murphy, 2020).On March 24th, UNESCO announced that the pandemic affected1.37 billion students and 60.2 million teachers in 138countries (UNESCO, 2020). As part of the pandemic precautions of minimizing transmission of the virus, lockdown was implemented all over the world and to break the chain of Covid 19, the government announced the suspension of classes for schools and all educational institutions. This had led to discontinuation of education for many children in India and other countries. The government did not know how to respond to this sudden outbreak. Respondinggradually to be on the safer side, theeducational institutions in India transitioned from the classroom to online learning systems. The movement towardsonline teaching learning, brought about new challenges such as limited availability of devices, nonstopinternet access, teaching experiences for online learning, lack of resources and hands on expertise to manage online tools.

An effective teaching learning depends on various factors to make the classroom engaging so that a healthy learning environment is created, this is possible if the instructionalstrategiesusedbytheteacher are appropriate. Teachingmaterial, aids, resources, teachersknowledge, the provision and the training given to the teachers also contribute in this.

During pandemic there has been a rapid transitioninthemodeofteachingand learning process. Digital classrooms have not just challenged the interaction among the teacher and the learners but also the resource material that can be used for effective teaching and learning processes. The topic for the project is based on digital tools to enhance teaching learning in online mode. The relevance of digital tools in onlineclassandhowthechangeshave been made during the pandemic situation. Teaching aids according to NCF,2005 serve the purpose of making the school interesting for children. teaching materials serve as a means to help teachers to introduce or explain on topic effectively. A well planned and specific teaching is possible with the help of appropriateteachingmaterial.

Teaching materials make the lesson interesting and easy to understand. Activity based learning employs a variety of teaching and learning materials focus on students' interaction to learn new concepts. Context specific learning aids enhances the process of teaching. Teaching materials have the potential to affect a student's cognitive affective and psychomotor domains of the learning process. Relevance of teaching aids has been increased due to digital mode of teaching and learning purpose where there is limited time duration and moreover, limited interaction. The only source of engaging learners in the effective teaching learning process and in collaborative learning is the use of teaching aids. Technology has given a new opportunity to look for digital tools which serve as an aid. Technology provides teachers with means with which they can add strategies to their teaching.

According to Piaget's cognitive development theory children are active constructors of knowledge and when they engage with materials used for teaching and learning processes, they engage themselves in effective learning. they arecontinuously involving themselves in the process of assimilation and accommodation and construct their own knowledge. Piaget suggested that children understand the world around them by adjusting their ideas and they find differences between what they know and what they discover.

Whether digital or offline tools in form of teaching aids or materials, they work for the purpose of scaffolding the learners. Vygotsky's theory states that an essential feature of learning is that it creates the zone of proximal development; i.e. learning awakens a variety of internal developmental processes that are able to operateonly when the child is interacting with people in his environment and in cooperation with his/her peers.

When a child in the online classroom is engaged with the resources needed to develop an interactive class as they involve themselves in interaction with their peer groups and with the environment.

Student engagement is a multifaceted and complex phenomenon to understand, however, it is considered a critical factor in supporting student learning and development (Kahu, 2013). Quickly moving with the changing time, the need and usage of online tools started during the pandemic. School teachers rapidly deployed various forms of technologies into their learning environments, understanding how students engage with these technologies is critical to the design of flexible and highly adaptive learning environments that can cater to diverse student learning preferences. Also, understanding how students can be engaged with digital tools can let educators to train students with various digital literacy skills and knowledge to support their learning.

Though the current generation of students are digitally literate, but this literacy might be limited to engaging with devices for entertainment purpose and games rather than acquiring knowledge.

Since engagement is associated with academic achievement, researchers have identified various strategies to support better engagement (Barnacle &Dall'Alba, 2017; Kahu & Nelson, 2018; Koranteng et al., 2019). However, the meaning of student engagement means different things to different people (Kahu, 2013). Also, there is limited understanding of how students engage with learning technologies and the extent to which engagement with such technologies fosters enhanced learning outcomes.

Digital tools have always proved as an asset to make the process engaging hence there was a need to explore the various tools available online, understand the applications of various tools,thesupportgiventothe teachersbythe institution to use these tools.

**The objectives of this study are**
- To understand the support provided by the school to the teachers in online teaching.
- To learn about the various digital tools used by the teachers.
- To examine the various sourcesusedbytheteachersto understand digital tools online teaching learning material andstudy theutility of this material.
- To compare theusageofdigital tools by in-service and pre-service teachers.

**Theoreticalbackground**

There has been various research done on resources that are beingusedinonlineteachinglearningprocesses.

FernandoM. Reimers (2020) in their recent US basedresearch examined the resources that are supporting the continuation of teaching and learning during the pandemic. This one is a module of the series that were published in order to guide educators during pandemic.This US based research was done in collaboration with Harvard school of education andthe World Bank's education network. Resources are looked into in order to continue with the teaching learning process. The module talks about the survey in which respondents but from 99 countries and there were 333 participants. stakeholders were asked about the helpful educational resources which help to maintain the continuity with Education. They examined different resources on the basis of their type, language, subject and grade level. Skillsassociated with resources but also given importance such as social and emotional and cognitive skills to help students to learn outside the schools. Resources were broadly categorisedintocurriculum,professionaldevelopment, cognitive, interpersonal and interpersonal skills tools. Various tools were enlisted and the major categorisation was done under these broad categories. Tools along with their applications were given that highlights how tools are not just limited to their usage but also to the skills it provides along with the usage.

L.Zhou and F.Li3 (2020) reviewed one of the largest online teaching in China for elementary and middle school students during Covid 19 pandemic andthe article talks about China'sinitiativetocontinuewithteachinglearning process during pandemic. The ongoing project in China was "School is out but class is on " . Online teaching platform and resources for exam mint and the tools were divided into majorly seven categories such as socialtools,communication tools, platform services, teaching tools, public resource, subject content and comprehensive tutoring. Communication platforms were basically the platforms that were used as an auxiliary platform suchasWeChat,QQ,etc

Document delivery platforms included platforms that were used to transfer documents like email, micro classes, etc. There were also webcast platforms that were basically used for live casting like OBS, zoom, etc. Initially, news channels and educational channels were also used for this purpose. There was a drift in the perception for teacher that is, from ' one teacher one excellent class- to -' one excellent teacher one class". Parents cooperation was also considered as one of the major contributors inthecontinuationoftheeducational process. Also, effectiveness and problems were also talked about in this article to see the application of material in terms of their effect on learning.

According to Trust and Whalen (2020), "Should Teachers be Trained in Emergency Remote Teaching? Lessons Learned from the COVID-19 Pandemic" talksabouttheneedoftrainingteachers for remote teaching learning processes. It was found that not every teacher was a fluent user of technology and there were around 68% of teachers that never did remote learningbefore. Participants of this study felt overwhelmed and unprepared to use online or remote teaching strategies and tools and they struggled toadapttheirpedagogytofluctuating situations such as students unreliable internet

access, changing personal needs, shifting educational directives. There were various challenges and listed do wn in this suchas lack of quality internet access, lack of knowledge about remote teaching strategies, prioritisation of personal needs, lack of knowledge about remote communication tools, lack of communication betweenstudentsandparents,lackofsupport from administrators, ill-prepared knowledge about technology created additional barriers.

N. Peachey (2017) in the book "Digital tools for teachers "bythe digital classroom series is a book that has been written primarily to extrapolate the use of digital tools in language classrooms but it was believed that these tools can have wider usage also. The book containsmorethan70tools and resources. The chapters of the book are divided into simplepedagogicaltaskthat.Mostteachersneedtocarryout or help their students with and the descriptions of the resources are suitably concise to make the book easy for a stressed teacher to access and browse in a few spare moments between the class. The websites, applications and resources within the book have been divided into reading, writing, speaking, listening, grammar, presentation, poll and survey infographic, course creation tools. The tools which aimed in developing skills were majorly mentioned in this book. This was an initiative to help teachers to explore the tools available for teaching and learning online.

**Methodology**

The sample was taken from 25 pre-service teachers and 10 in service teachers. The respondents for the study had been teaching in online mode using various digital tools.

25 pre service teachers were from a college of University of Delhi pursuing Bachelors in Elementary Education. As part of the4-yearcourse, they have a compulsory internship component in which they are placed in a school for 24 weeks. Due to the pandemic, they were supposed to teach in online mode.

10in-service teachers, teachingmiddle classes in different schools were part of this study. The respondents were teaching in a privateorgovernmentschool.

Thedata was collected with the help of a questionnaire created via a google form. The questions were framed by keeping in mind the objectives of the study. Therewere19Questionsintotal, openended and closed ended questions. The data collection for the study was done online keeping in mind the pandemic situation. The data was analyzed quantitatively and qualitatively.

**Findings**

Theanalysesofdatafor pre service and in service teachers was done. The following areas were focused upon in usage of digital tools by the respondents.

▪ **Administrative support**-The administrative support by the school for both pre service as well as in service teachers played an important role. This support was in the form of arranging workshops, short term course with the help of a professional on the usage of digital tools.

Training for online teaching is an important aspect to understand the nuances of the digital tools available. Various studies showed that training can be helpful in creating an effective learning environment for learners. In order to develop skills to use digital tools it is important fortheinstitutionstoprovideteacherswith proper training and opportunities to explore digital resources. 80% of the pre service teachers reported that they were trained by resource persons through three online workshops and one short term course to use various platforms.90%of the in-service teachers were dependent on you tube for learning about the usage of digital tools.

**Figure A**
Frequency of training for Pre service Teachers
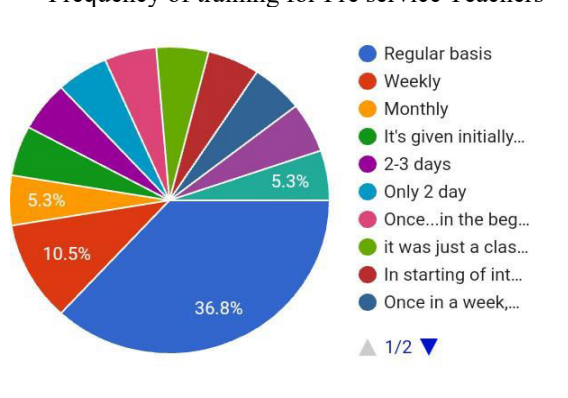


36.8% of the pre service teachers were given training on a regular basis, 10.5% were given training on a weekly basis, 5.3% were given training on a monthly basis. The other options like training for two or three days, only twodays,onceina week or once in a day before class constituted less than 5% of the population of study.

**Figure B**
Frequency of training for In service Teachers
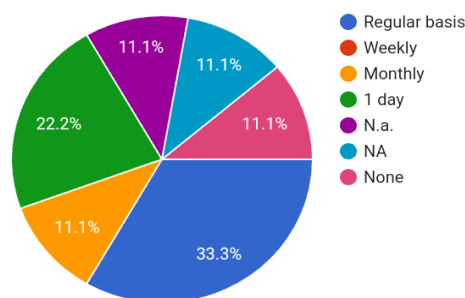


The data of in service teachers showed that 33.3% were giventraining on a regular basis and 22.2% were given training for a day and 11.1% were given training on a weekly or on a basis .

- **Source of Training**

The training for digital tools was provided through various sources. These sources were mainly by You tube links or resource person. Theseallfactors add up to the motivation and confidence of teachers.

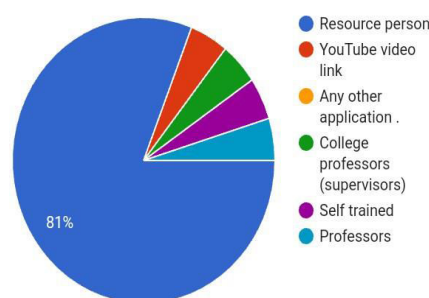**Figure C- Sources of Training for Pre service Teachers**



Figure C indicates that 81% of the pre- service teachers were given training by a resourcepersonand 19% were given training by their faculty members. None of the pre service teachers got trained through Youtube video links.

The respondents shared that the training given by a resource person added up in experiential learning and they were able to clarify many doubts and further learn about the tools by forming a whats app group of the learners.

**Figure D-Sources of Training for In service Teachers**
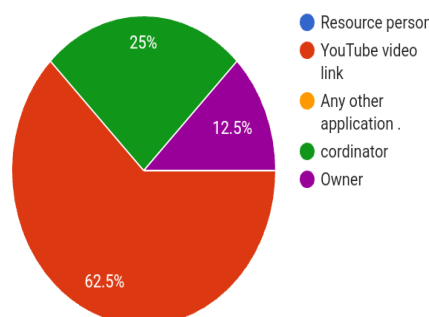


The above data shows that 62.5% in service teachers were self trained by YouTube video links, 25% of the in-service teachers were giventraining through the coordinators of the school and 12. 5% weretrained bytheowner of the school. TheCOVID-19crisishashighlightedthatboth pre service and in-service teacher education are in need of reform to better

train teachers innewmethodsofeducationdelivery.

▪ **Usage of Various Digital platforms**- Various applications,softwares and websites wereusedduring online teaching.According to the data received and presented in figure E and F, majority of the teachers both pre service as well as in service teacherswere using 'Zoom' application as a medium for onlineteachingandlearningpurposes.The reason behind the extensive use of zoom by teachers is primarily due to institution recommendations, various easy to use features and the ease of learning the platform. The teachers were more confident while using the zoom application as there were various features like screen sharing made this platform user friendly, meeting linkscanbecreatedeasily, students could connectthrough the link, teachers couldsecure their meetings using passwords and they can schedule their meetings any time whichmakesitmoreconvenientforteachers.40 minutes free plan of zoom application is suitable for all the teachers and it allows them to have a smooth class online.

**Figure E-Usage of Various digital platforms by Inservice teachers**
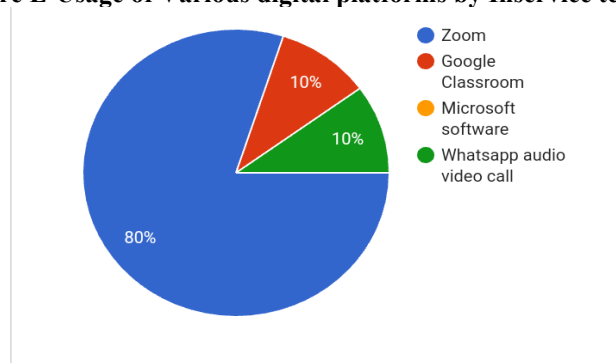


**Figure E-Usage of Various digital platforms by Preservice teachers**
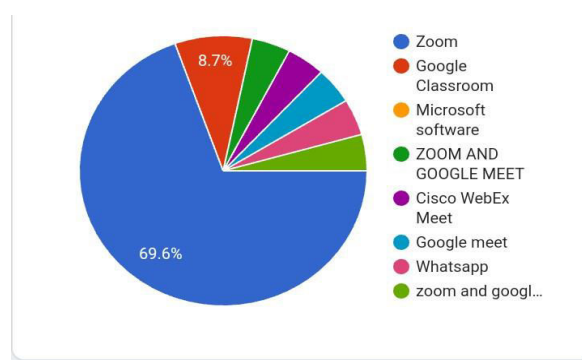


▪ **Usage of online teaching aids**-All the preservice teachers only online teaching aids. These aids were quizzes,power pointpresentations, audios, white boards, concrete materials, jam board,videos and so on .It was found fromthedataofpreserviceteachersthatmajorly they were using presentations and videostofacilitatelearning in the online mode.10 % of the inservice teachers usedpower point presentations, quizzes, word files, white boards for online classes. In service teachers shared that various websites wereusedforpreparing for online classes, the most commonly used were pinterest , YouTube , merit nation.

90% of Preserviceteacherssharedthatthey used reference books for making worksheets, they used pinterest, google, quizizz, kahoot, wordwall, google forms, MS office, YouTube , NCERT , Arvind Gupta toys , worksheet.com , British council , survey heart, worksheet master , peerdeck ,googleslides, Microsoft office, puzzle, MSword , story weaver .com , liveworksheets.com , mathsgames.com, nasalclimatekids.org, askiitians and so on .

Development of digital tools depends upon a teacher's pedagogical skills, experiences and confidence in handling technology. In order to understand theseaspects, the study included questions on age, the experience that the teachers might be having, their confidence in handling technology andtheirpedagogicalskills to understand the usageoftechnologyforonlineteachingand learning processes. There is not only innovation linked to technological aspects but also the emergence of new pedagogical aspects. Online learning implies revising the approaches used in face-to-face lessons.

Experiencesofsocialdistancingduringthepandemic have enabled us to understand that pedagogical patterns must be different in virtual classrooms. In the virtual classroom, the educator is more like a moderator and consultant, and lessons cannot be arranged as in a physical classroom. Therefore, learning, especially guidance and feedback, should be given in a different way. Innovations in teaching methods are therefore needed to engage students, stimulating their

proactive behaviour, which is difficult toobtain when one is only connected online. In particular, new approaches to maintain children's attention and participation on a screen for a long time are needed. Firstofall,inorderto plan an adequate pedagogical course for remote teaching, itis necessary to increase the technological skills of all involved. Teachers should be trained to increase digital and other specific skills for online education in order to adequately plan and implement an innovative pedagogical programme.

**Conclusion and Implications**

Online learning and exploring digital tools is an exciting new way to learn about anything. It has bought a positive impact on the lives of students as well as teachers. It hasgiven both teachers and students the opportunity to go beyond chalk and blackboard. The increasing use of technology in the field of learning has improved the quality of education. Both students and teachers have optimistic views about online classes.

The study shows the even though there was little administrative support for the teachers but the urge to learn new digital tools made them learn it themselves. Pre service teachers were given more qualitative training as compared to in service teachers which was somehow reflected in the variety ofwebsitesbeingusedbythemforthedevelopmentof digitaltools.Apositiveresponsewasseenfromlearners'side which shows that effective teaching learning with digital tools can be done from their own comfort zone as well. The study also provides insight to several other educators who are currently working online for thekindofdigitaltoolsthatcanbe used for effective teaching and learning processes.

Some of the tools giveninthestudyandthekindsofwebsites provided can be used for offline classrooms as well. The study has focused on the objectives to understand about the development of digital tools in online classrooms in depth.

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