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The aim of TOJDEL is to help students, teachers, school administrators and communities better understand how to organize distance education for learning and teaching activities. The submitted articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to TOJDEL. TOJDEL provides perspectives on topics relevant to the study, implementation and management of learning with technology.

I am always honored to be the editor in chief of TOJDEL. Many persons gave their valuable contributions for this issue.

Call for Papers

TOJDEL invites article contributions. Submitted articles should be about all aspects of distance education and e-learning, assessment, attitudes, beliefs, curriculum, equity, research, translating research into practice, learning theory, alternative conceptions, socio-cultural issues, special populations, and integration of subjects. The articles should also discuss the perspectives of students, teachers, school administrators and communities.

The articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to TOJDEL.

For any suggestions and comments on the international online journal TOJET, please do not hesitate to fill out the comments & suggestion form.

October 01, 2020
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ENTANGLEMENTS OF POSTHUMANIST BILDUNG IN VIRTUAL LEARNING ENVIRONMENTS

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ABSTRACT
This study investigates processes of *Bildung* in the entanglements of space, time, and student collaboration in a Virtual Learning Environment, itslearning. It is a novel approach as the theoretical framework of posthumanist *Bildung* was introduced in 2017 by Carol Taylor. The data was read with theories on posthumanist *Bildung* during the diffractive analysis to understand differences in the entanglements between human agents (participants) and non-human agents (deadlines, delayed communication, course content, online posts). The questions pursued are as follows: In what ways are space, time, and student collaboration entangled in the Virtual Learning Environment? What effects do these entanglements produce in the material-discursive practices during the course? Data are reflections by 62 participants in an online course in a Finnish university of applied sciences (2018). The implications of the study are that collaboration in Virtual Learning Environments can involve many entanglements (e.g., cognitive/emotional, theoretical/practical, personal/professional) that matter and are meaningful to the participants because these entanglements are produced in relation to other people and to the time and technologies available.
Keywords: posthumanist *Bildung*, higher education, distance education, MOOC, entanglements

1. Introduction

This article is an empirical study in higher education where we wonder about entanglements of space, time, and student collaboration in relation to posthumanist *Bildung*. Posthumanist *Bildung* is a nascent field, introduced by Carol Taylor (2017). It offers new ways of perceiving *entanglements* of how humans do, know, and act in relation to spaces and the difference these entanglements can make. Taylor (2017) calls these entanglements *knowing-in-becoming,* which includes emotion *and* cognition *and* doing. Posthumanist research moves beyond dichotomies like emotion or cognition, theory or practice, human or machine to avoid drawing sharp edges around concepts. Instead, it studies the messiness of human existence in a material world and the entanglements of body, mind, and space (Bayley, 2018).

According to Taylor (2017), the agency of spaces and humans both matter in posthumanist *Bildung*. "The environment is not just a reser-voir of information whose circuits await mapping, but also a field of forces whose actions await experiencing" (Deleuze, 1988, p. ii). The people acting in a particular space matter, but space also matters (Barad, 2007). The space for learning is more than a container of information; it becomes an agent through all the actions it is entangled in. People log onto a Virtual Learning Environment where they act through/with/in the digital system. People share and shape the space with other human agents (teachers, students, IT-personnel), with non-human agents (quizzes, texts) and more-than-human agents (chatbots, personalized digital feedback). Entanglements in a digital space may include all of these agents, depending on their effects on the different agents' actions.

Researchers consider Virtual Learning Environments to be digital environments synonymous with e-learning or distance education (Annetta, Klesath & Folta, 2010; Bates, 2005; Weller, 2007). In distance education, time and space are of interest as the general definition of distance education is that teachers and learners are separated by time

and space (Moore, 2015). Student collaboration is often included in online courses to support social interactions between participants to reduce isolation and distance between learners (Anderson & Dron, 2011; Cherney, Fetherstone & Johnsen, 2018). Previous studies on online collaboration offer diverse perspectives on the phenomena. For example, measurements of communication patterns in online discussion forums (Oztok, Zingaro, Brett & Hewitt, 2013). The importance of creating a sense of belonging within the online community to avoid alienation among students who are navigating a digital platform and collaboration at the same time (Peacock, Cowan, Irvine & Williams, 2020). Psychological and cognitive factors for collaborative learning online are other areas of previous studies (Cherney et al., 2018). However, posthuman theories that move beyond material and psychological dimensions are, to our knowledge, rarely included in studies on collaboration in Virtual Learning Environments.

This article's authors collected the empirical data during a distance course in a Finnish university of applied sciences (2018). The course topic was leading teams, and it lasted five weeks during the summer semester (June–July). The data are written reflections by 62 participants from different higher education institutions. The questions pursued in the article are as follows: In what ways are space, time, and student collaboration entangled in the Virtual Learning Environment? What effects do these entanglements produce in the material-discursive practices during the course? The students collaborated asynchronously on the digital platform, itslearning. It provided the participants with the flexibility to work or travel while studying. The participants read the course material before they took part in the online discussions by adding posts to a discussion forum. It made us consider spatial and temporal aspects of the course when the collaboration was, so to say, produced differently than if participants would meet in a synchronous videoconference or if they were free to choose the platforms they wanted to use for collaboration.

Jeremy Knox (2016) has studied Massive Open Online Courses (MOOC) in higher education from posthumanist perspectives. A MOOC can involve hundreds or thousands of participants and be designed in different ways. Some MOOCs are incredibly flexible; other courses are more structured. Some MOOCs include only individual course work, while others are designed for collaborative tasks. However, MOOCs generally build on humanist assumptions of the participant as an autonomous, rational, and self-directed learner that initiates online activities. The idea is that every participant should reach the same learning goals and that each participant has the same skill set to do so; this derives from the humanist position where everyone is essentially the same (Knox, 2016, p. 309). The course design often builds on feedback from non-human or more-than-human actors in the digital system, while few human interactions are included. Generally, the digital space is seen as a neutral tool. However, the universities and their partners, the technologies used, the required activities on the platform, and the data gathered about participants are examples of the complex entanglements between humans and non-humans. Previous research rarely addresses these kinds of entanglements when MOOCs are concerned (Knox, 2016).

The distance course studied in this article is a MOOC with around 240 participants with diverse backgrounds and different motives for taking the course. Besides the individual and collaborative tasks, the course design also included social interactions with the teacher via chat or email. According to Knox (2016), this is one way to challenge humanist and universal assumptions about course participants and provide support according to their individual needs. Furthermore, Knox suggests that posthumanist research can enrich distance education by acknowledging the digital platforms' agency and their role in the relations established during courses. Although MOOCs claim to offer courses at a time and space convenient for the learner, a typical outline is a linear course structure that requires participants to complete a topic before moving on to the next. This outline suggests that all learners learn at a certain pace and in a particular sequence. It forces participants to follow a timeline set by the university and understand the content within the platform. In contrast, students engage less with the outside world and knowledge outside the university. Knox questions the fast-paced and efficient ideas embedded in many MOOCs and if they allow time for reflection among participants. These ideas seem to cater to a certain kind of autonomous learner responsible for very few humans and non-humans besides himself. These are some temporal and spatial

entanglements that posthumanism addresses, which matter for distance education if it is to be inclusive, responsible, and ethical in the future (see also Bayley, 2018).

The article continues with a brief background on *Bildung* and posthumanist *Bildung* (section 1.1). After that, we establish the theoretical frame of posthumanist *Bildung*. We discuss the key concepts (entanglements, material-discursive practices) for the analysis in section 2. In the third section, we present research on collaboration in Virtual Learning Environments to provide a contextual frame for the article. We discuss the diffractive analysis in the fourth section. The results (section 5) are then presented, followed by a discussion (section 6). A general conclusion ends the article.

1.1. Background

Bildung has a long and rich history. According to Rebekka Horlacher (2016, p. 118), "*Bildung* adapts to different historical, social, and cultural contexts without losing its relevance or significance…the term's strength lies in its inconstancy, openness, and arbitrariness." A basic definition of *Bildung* is "cultivation of the inner life" (Biesta, 2003, p. 62). It means a process of self-improvement where transformations of the Self take place in relation to culture (i.e., the society). *Bildung* is a German concept closely related to education, often translated to self-cultivation in English (bildning in Swedish, sivistys in Finnish, dannelse in Danish and Norwegian). Michael Uljens (2003) defines *Bildung* as a never-ending personal process - open, reflective, intellectual, and moral - interlinked with culture, other people, and efforts for a better world. Human beings need to interact with the world to take part in processes of *Bildung* - these processes are about personal development *and* making the world better for others. *Bildung* assumes that human beings have an *ethical responsibility* for others (Horlacher, 2016). Dietrich Benner (referenced in Horlacher, 2016, p. 119) suggests postmodern *Bildung* mediates between the individual and society, without sacrificing individuals' needs to those of society, or vice versa.

Posthumanist *Bildung* belongs to a postmodern and critical strand of the *Bildung* tradition (Taylor, 2017). It questions the focus on inner life and personal reflections. A humanist position may disregard other species and material aspects of educative processes. Posthumanist *Bildung* offers analytical tools to understand human and non-human agencies for being/knowing/doing, or "the materiality of educative relations" (Taylor, 2017, p. 422). The Self is not detached from the world or an outside observer. Human beings are frequently involved in many different kinds of meaningful relationships. Some relationships are with other human beings or other species. Some relationships are entangled within spaces, time, and technology.

Virtual Learning Environments may offer space and time for entanglements between course participants, course materials, and with different non-human and more-than-human actors. However, Virtual Learning Environments are not neutral, nor are they the only answer to educational questions on organizing education in the future. Distance education can be part of the solution, but a posthumanist *Bildung* investigates the messiness of it all and the troubles it brings too (Taylor, 2017). For example, collaborative online writing can empower students to produce better texts if they can access digital tools (chats, video conferencing, online documents, information) to structure their collaboration and texts (Hilli, 2019). Interactions with classmates and teachers may offer support and feedback to focus further and strengthen the text. Online collaboration can also quell the individual writing style in favor of team consensus, forcing students to lower their writing standards, constraining their agency. Difficulties in accessing information or lack of timely communication with the group may further complicate the writing process (Hilli, 2019).

2. Posthumanist *Bildung*

Carol Taylor (2017, p. 433) defines posthumanist *Bildung* as a matter of spirituality *and* materiality to make a material difference in the world. It is sensitive to the agencies of other humans, animals, non-humans, more-than-humans, and the materiality and embodiedness of human existence. Posthumanist *Bildung* is about

being/becoming/belonging in the world and being aware of the relationships taking shape and the part other agents play in them. "A posthuman *Bildung* is, therefore, nothing more or less than education as an ethico-onto-epistemological quest for (better ways of) knowing-in-being" (Taylor, 2017, p. 433). It means ontological, epistemological, and ethical entanglements of humans of the world, with the world, and for the world. Instead of dividing the content to be learned from the process of learning, or the learners, or theories from practice, posthumanist *Bildung* sees them as entangled in students' "knowledging" (Taylor, p. 430). In education, course content and learning goals are examples of material agents that co-constitute *material-discursive* knowledge processes. Processes of *Bildung* would then be entanglements of material-discursive practices course participants are embedded in, affect, and are affected by during their studies. Essential concepts for the analysis are *entanglements* and *material-discursive practices*.

Annouchka Bayley (2018) explains becoming and embeddedness as being in flow, just as space, time, and matter are also already in motion. Students carry with them knowledge, experiences, fears, and are entangled in many spaces that matter to them. Therefore, these entanglements should matter to educational practices. Thus, posthumanism moves beyond dichotomies, for example, human and non-human, space and action, cognition, and emotion - they are seen as co-constitutive of each other. Karen Barad (2007, p. 185) explains it as follows:

> Practices of knowing and being are not isolable; they are mutually implicated. We don't obtain knowledge by standing outside the world; we know because we are *of* the world. We are part of the world in its differential becoming.

To Barad (2007, p. 139), matter is not limited to the material world and physical spaces. Ideas are entangled with matter making the discursive world entangled with the material world. Both are essential for knowing/being/acting in the world. Barad uses *material-discursive practices* for the relationships between matter and meaning and the effects they have on each other through entanglements or intra-actions. Entanglements bring focus to boundaries/effects/differences of material-discursive practices (Barad, 2007, p. 140–141). To Barad, material-discursive practices are entangled in intra-actions produced and performed forever - much like *Bildung* processes that are never finished and ongoing forever.

Rosi Braidotti (2019) discusses two concepts that we relate to *Bildung*; posthuman knowledge and affirmative ethics. To Braidotti, posthuman knowledge is non-linear, non-hierarchical and a shared effort within a community of learners that transverses, for example, local and global, nature and technology, time, and space. Affirmative ethics (Braidotti, 2019, p. 166) stresses the relationships we are involved in and the responsibility we have to create a community of empowerment and "ethical propensity". In this study, the context of student collaboration at a distance may benefit from the posthuman turn for several reasons. It implies a turn towards knowledge as something situated and enacted in between people and in between people and technology. Collaboration in a posthuman view includes an ethical responsibility to respect multiple agents and welcome and empower others to collaborate actively.

In this article, agency is extended to the course participants, temporal and spatial matters in the online course's material-discursive practices. A previous study on upper-secondary school students' collaboration suggests that Virtual Learning Environments can offer communicative spaces for empowering students to act for the benefit of their fellow course mates and the world (Hilli, 2018). Immediate and delayed forms of communication can make the process diverse and inclusive within a group of students. The process was signified by participants' theoretical, practical, and ethical knowledge to understand and act in the digital space (Hilli, 2018). It is one way to understand human and non-human entanglements and complex material-discursive practices taking shape during a course through the participants' backgrounds, the design of the learning environment, the selected content, and the methods or activities participants take part in. In the next section, we discuss virtual collaboration and previous research on it.

3. Collaboration in Virtual Learning Environments

Online collaboration is a growing research field within distance education, partly because technological developments have made collaboration possible. Social psychological approaches to learning (social constructivism, sociocultural theories) have also influenced platform and course designs (Anderson & Dron, 2011). Cherney et al. (2018) did a meta-synthesis on small group work in online courses and found conflicting results (e.g., group size) and definitions (e.g., social presence). The authors identified a lack of theoretical frameworks and empirical research on effective teaching strategies for online collaboration. The most common theoretical framework was social constructivism and knowledge as constructed through social interactions. The authors suggest a need for experimental studies that measure specifically cognitive outcomes since many studies investigated affective outcomes (e.g., student satisfaction). Educational researchers did most studies, and there was a lack of interdisciplinary perspectives. The role of communication in digitally mediated environments was rarely included in previous research. However, it requires more exchanged messages between users to achieve the same closeness level as in face-to-face interaction.

Benefits of collaboration include student appreciation for the knowledge group members bring to the discussion, leading to deep learning and new perspectives. Other advantages include improved knowledge acquisition, retention, accuracy, the creativity of problem-solving, and higher-level reasoning among students (Barkley, Major & Cross, 2014; Pascarella & Terenzini, 2005). Students perceive collaboration as fun, and it allows them to get to know fellow students better. Cabrera et al. (2002) found that cooperation supported college students' openness to diversity, appreciation for fine arts, their development of interpersonal relationships, and active and responsible citizenship - aspects closely related to *Bildung* (cf Horlacher, 2016) and posthumanist *Bildung* (Taylor, 2017).

Issues with collaboration include a reluctance to take part in collaborative tasks for different reasons. Students do not want to rely on others to complete a course and prefer individual assignments (Barkley et al., 2014). Students may lack interpersonal skills and avoid communicating with group members. Some students do not fulfill their commitment to the group and do their part of the group work. Peacock et al. (2020) suggest that online group work is a flexible way to provide learners with relevant resources and educational opportunities. However, studies show that learners are reluctant to participate in online discussions because they lack academic skills. Learners may also miss a sense of belonging with the group and in the online environment, which is why community building and relationships between learners are essential.

Linda Harasim (2012, p. 102) suggests certain discourses characterize discussion forums: place-independent, time-independent, many-to-many, text-based (with multimedia), internet-mediated. Forums are accessible from any device that is connected to the internet. Users can include texts, videos, graphics while communicating. Participants can access information outside the learning platform too. Forums are accessible 24/7, and asynchronous tools offer participants the flexibility to communicate at a suitable time and in a place of their choosing. The group discourse supports interactions between participants and the different perspectives they bring with them. Discussions can provide diversity through several views, and shared knowledge-creation processes can be creative. However, discussion forums are rarely designed to follow the phases of collaboration. It can be cumbersome for users to organize online discussions with voluminous posts or threads on different topics (Harasim, 2012; Weller, 2007).

Virtual Learning Environments often include collaborative tools (e.g., discussion forums, shared documents) that can be used for different group tasks and within different time frames (Annetta, Folta & Klesath, 2010; Bates, 2005; Weller, 2007). Online interactions between students can be delayed (asynchronous) or immediate (synchronous). Asynchronous communication gives students the flexibility to add comments when they have the time for it, and they can reflect on the content and the discussion before answering. Synchronous communication adds to the spontaneity between participants, and questions or comments can be addressed by teachers or participants immediately. It is less flexible than asynchronous communication as it requires group members to be present in the

same online space at the same time (Falloon, 2011; Weller, 2007). Adult learners are assumed to prefer asynchronous discussions because of their schedules and many other engagements (Hrastinski, 2008; Oliveira, Tinoca & Pereira, 2011).

Asynchronous communication can leave participants feeling isolated from their peers, leading to decreased learning (Weller, 2007). Samuels-Peretz (2014) investigated interaction patterns in asynchronous discussions in an online course. The online discussions allowed equitable participation, and the focus of the discussions was on the content rather than popularity (e.g., likes, ratings). The others generally ignored students who did not add anything new in their posts. Samuels-Peretz suggests that participants may be unsure of how to participate, and model examples from the teacher may be one way to establish guidelines for the discussions (cf. Peacock et al., 2020).

Oztok et al. (2013) investigated students' usage of synchronous and asynchronous tools in online courses at a Canadian university. They introduced a synchronous instant-message function for participants to exchange private messages instantly or once they logged on to the digital platform. Participants could add and reply to notes on an asynchronous discussion board. Asynchronous discussions automatically created a thread where all notes were visible. The authors found that the most avid asynchronous users also actively used synchronous messaging. Previous research confirms that students combine different modes of communication for various purposes. Drawbacks of synchronous written communication include difficulties of seeing the links between messages (Holmer, Lukosch & Kunz, 2009) and the lack of technology to moderate the discussions (Harasim, 2012).

Previous studies on online collaboration suggest cognitive, emotional, and relational aspects can become entwined within the collaboration. Some participants seem to struggle to take part actively. Spatial aspects seem to matter as participants may have access to different or few tools for collaboration. The communication between group members can be organized and enacted in different ways on a digital platform. In the next section, we discuss the method of data collection and analysis.

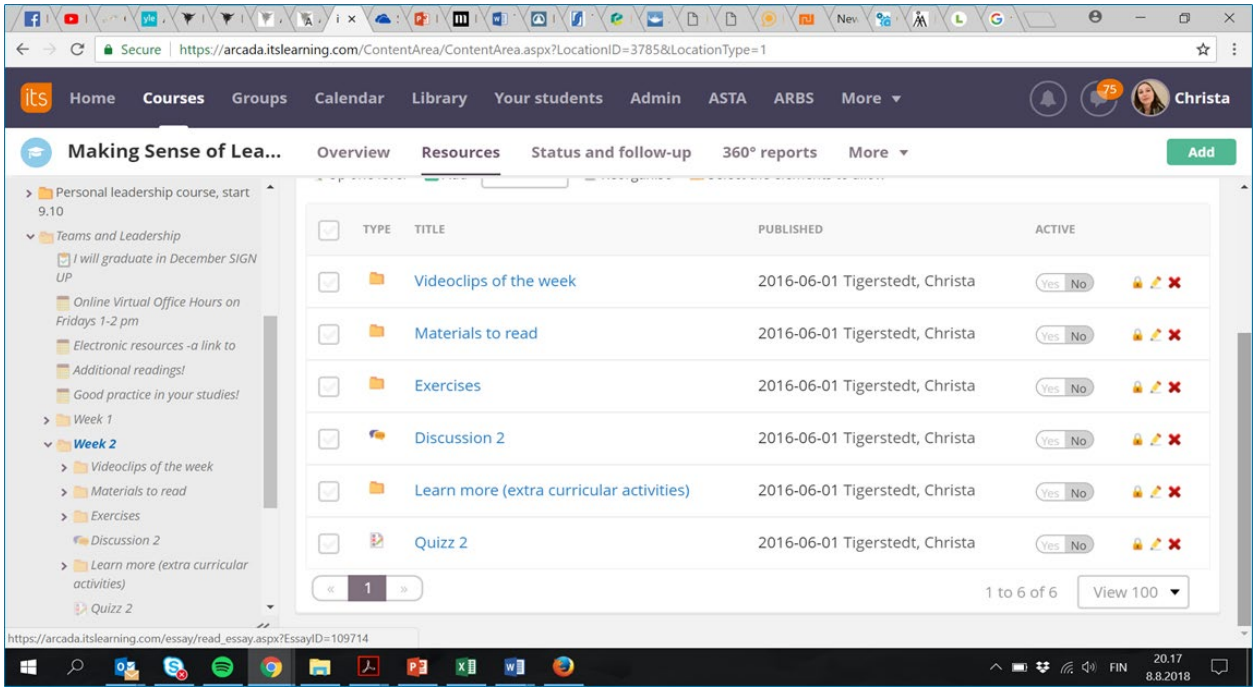
4. A description of the online course and the Virtual Learning Environment

The context of this study was an online course on team leadership in a Finnish university of applied sciences (June–July 2018). The course was a part of a three-course module, all online and all related to leadership. Three teachers had developed it over some years. The course had 241 participants from different universities and disciplines, and most students did not know their peers. The language of instruction was English. The coaching teacher (Tigerstedt) had made teams of ten people and discussion forums for each team. All discussion forums were visible for all participants.

The learning goals were: 1) Formulate, theoretically motivate and discuss team leadership and successful working in teams. 2) Critically discuss different leadership and team theories. 3) Understand and interpret the importance of shared visions and the meaning of the whole in successful team performance. 4) Demonstrate and discuss a variety of team leadership strategies and tools that are adaptable to different and challenging work situations. 5) Show increased leadership efficiency in teams. The formative examination consisted of individual and team assignments. The assignments and digital tools were as follows: 1) Active participation in a discussion forum (team-wise discussions with a clear aim or topic). 2) Completion of quizzes. 3) An individual blog assignment. 4) A team assignment consisting of a written report on a specific course topic. 5) Active participation in peer-reviewing the team reports of other student teams.

The course content was published weekly for five weeks. Some elements or assignments had to be done during a specific week, after which they closed. Other tasks were open throughout the course. It was not a purely self-paced course since this would have led to challenges in the collaborative phases. The coaching teacher had weekly online office hours for synchronous support and offered asynchronous support via e-mail and the LMS messenger service (itslearning).

The main tools were discussion forums and shared online documents. Most groups used asynchronous communication in the discussion forums. Some groups included synchronous group chats on social media (e.g., WhatsApp, Messenger). The course took place on the university's online platform, itslearning. The platform was familiar to most students. Below is a screenshot of the course assignments in the Virtual Learning Environment.



Picture 1. Screenshot from the course learning environment.

The data and ethical considerations

The data were three written, individual reflections on the online assignments; in the beginning, midways, and at the end of the course. The reflections were between one and three pages long. The reflections were written in English, although most participants were not native English speakers. Grammar errors have been corrected to improve readability. The higher education institution approved the study before the course began. The coaching teacher informed the participants about the study when the course started. 90 participants out of 241 agreed to take part in it. Sixty-two participants (36 women, 26 men) turned in all three reflections leaving the authors of this paper with 186 reflections on 68 pages.

Analytical cuts

The diffractive analysis (Barad, 2007; Bozalek & Zembylas, 2017; Lenz Taguchi, 2012) of the entanglements in the Virtual Learning Environment meant reading the reflections with theory and through each reflection. The reflections were printed out, interesting sentences were highlighted, notes were made on paper, and post-its, while the final writing process took place in an online document. Reading became an act of infolding where each reflection deepened the overall understanding, continually adding to the infold. The literature on diffractive analysis and posthumanist *Bildung* was likewise read several times, making the reading a slow process as it added another infold (Haraway, 2007).

Diffraction is driven by a desire to add new knowledge to the field and change the future (Barad, 2007). Diffractive patterns discern where differences occur and when patterns of differences are produced (Haraway, 1997, p. 34).

Diffractive patterns matter in *material-discursive practices* as they affect how the practices unfold (Barad, 2007, p. 72). Five agential cuts were made at entanglements that enacted the boundaries within the entanglements (Barad, 2007). Patterns of differences were identified in the entanglements of the human agents (the participants) and temporal and spatial agents that mattered for the collaboration.

The diffractive analysis is not representative. It shows the differences found in the data. Other cuts would show other boundaries within other entanglements (Bayley, 2018). Entanglements are difficult to study since they "change from the moment to the next or from one place to another" (Barad, 2007, p. 74). New studies will undoubtedly shed a different light on collaboration in Virtual Learning Environments as the contexts of and actors involved in the entanglements will be different. One of the authors (Hilli) analyzed the reflections while the other author taught the course and provided knowledge about the context and access to the data (Tigerstedt). Both brought something to the analysis when the data collection was planned and initiated. Once the analysis was underway, both were affected by it, exemplifying the researchers' ontological, epistemological, and ethical entanglements with the data and the results (Barad, 2007). In the next section, we present the five agential cuts that transverse the spatial and temporal entanglements within the collaboration.

5. Analysis: Spatial and temporal entanglements in online collaboration

The sections below include the five agential cuts of the analysis. We have included excerpts from the data to give the participants a voice. They provide examples of the differences in the data and the deeply entangled material-discursive practices. The sections are divided by headings that follow the process of infolding described above and the *spatial* and *temporal entanglements* with *material-discursive practices* in the course.

Agential cut 1: *Online collaboration as experimenting with conflicts.* The first cut identified entanglements of material-discursive practices among the participants. Personal and professional motivations to take the course that was entangled with the content and materials of the course and method of collaboration. The human agents (the participants) faced authentic conflicts during the collaboration that made theories on conflict management relevant. They reacted differently to the conflicts. Some participants became more active and took charge of the discussion by adding more posts in the discussion threads to motivate and include others. Some participants withdrew from the collaboration and stayed silent when they received no response from their team members.

Agential cut 2: *Online collaboration whenever/wherever*. In the second cut, temporality and spatiality were entwined as the participants could take part in the course whenever and wherever they had access to itslearning. Personal and professional entanglements meant some participants were working, traveling, or taking time off in different locations, meaning they were temporally and spatially restricted from taking part in the collaboration.

Agential cut 3: *Delayed communication and inaccessible spaces.* Temporal (deadlines) and spatial (internet access, itslearning) entanglements affected the collaboration in the third cut. Deadlines seemed to set the collaboration in motion, while a lack of internet access in some cases became a material strain on the collaboration. The design of the course page in itslearning played its part in the relations established between the group members. In some cases, it created a negative distance between the participants because of the information overload the participants experienced every time they logged on to itslearning. Within that entanglement, a paradox was later identified (agential cut 5).

Agential cut 4: *Online collaboration as shared and extended knowledge.* The fourth cut opened up entanglements between the relations between participants in relation to spatial and temporal matters. In their online posts in itslearning, the participants could share their knowledge on the topics discussed and their personal experiences. The responsibility for the collaborative course work was extended to each group member. In their asynchronous communication, the participants actively decided how to entangle themselves with the content, with the activities, and with the group members.

Agential cut 5: *The paradox of online collaboration.* A surprising spatial and temporal paradox was opened up in the fifth cut. The same flexibility that motivated participants to take a summer course on team leadership also meant delays in communication because group members were not communicating in the same place at the same time around the same content. In some groups, it led to conflicts that participants tried to solve by changing their behavior toward group members. Some participants tried to avoid conflicts by not taking part in the collaboration actively (cf. agential cut 1).

Agential cut 1: Online collaboration as experimenting with conflicts

The participants had professional reasons for taking part in the course as well as personal ones. They wanted to become better team members, leaders, and communicators throughout the course. They also wanted to expand their knowledge and get to know their group members. The participants reacted in different ways to issues with collaboration. Some participants became frustrated, silent, and withdrew from the collaboration, unable to implement the theories they studied during the course. Others saw the conflicts and the course content as practical experiments on how to handle conflicts, and they took an active part in the group communication by responding to posts and by encouraging their team members to take part in the discussions. To some participants, the collaboration offered agency to implement the course content in a practical setting in relation to the group members.

> *The entire course was one big experimenting playground. I found opportunities to create and dissolve conflicting situations in a team discussion, participated in team formation, observed people say one thing and do the opposite.*

Agential cut 2: Online collaboration whenever/wherever

The online course meant flexibility for participants to take part in discussions whenever they had the time and wherever they were. Flexibility was entangled with *temporal relations* such as deadlines and schedules when the group work was concerned. Deadlines set the actions in motion in most groups and created an incentive to collaborate. The deadlines were a cause for concern as other responsibilities (e.g., work, travels) during the summer called for the participants' attention, making the collaboration more difficult or more focused depending on the team. The deadlines were an important part of the course's *material-discursive practice* in relation to the flexible and open group assignments that the groups decided on amongst themselves.

> *I believe that it brings a lot of flexibility - you don't need to be physically present during the class. It is a big advantage, especially during the summertime, as it allows you to work from anywhere and at any suitable time, of course, within the deadlines given. At the same time, this flexibility might be dangerous, as you have to always manage your time properly, not postponing everything till the end, and working constantly.*

Spatial issues with the design of itslearning were entangled with temporal matters relating to asynchronous communication. The design meant the participants saw the posts made by all participants from every group anytime they logged onto the platform. It created a sense of confusion and frustration among many participants. They felt that hidden group folders would have been better for the collaboration to run smoothly. The asynchronous communication did not necessarily support relationships being established between group members. The combination of issues with accessing the group discussions and a lack of communication between group members created problematic disconnections in many groups. Something many participants felt would not have been as acute if they had communicated synchronously, which at the same time would have created a fixed time to meet as a group.

> *I didn't really like the way the discussions were presented or the week plan interface, it wasn't user friendly enough for me, and I didn't see a lot of things when I should have seen them (as some of the discussions*

and surveys). I will definitely try to meet people personally or in a Skype call before starting working with them and make our goals and objectives clear and connect in a soulful/personal way first.

Agential cut 3: Delayed communication and inaccessible spaces

Spatiality and *temporality* were entangled with the *material-discursive practices* of the course as participants im/patiently waited for group members to take the time to respond and to join them in the discussion forum. To some participants, asynchronous written communication in itslearning meant a positive delay in the sense that participants could build on what previous posts had said by relating to what others had written. The relations between the human actors (the participants) were entangled with non-human actors (course materials, online posts) in an on-going discussion that invited group members to continue on threads if they felt they had things to add.

Online discussion is nice in the sense that you don't have to try and come up with things to write about yourself, but rather you can just continue on the topics that the other wrote about, which is really nice. I think our online discussions in this course have been OK. I noticed that sometimes the discussion takes place really late in the week, probably because of people doing the reading and watching of video materials later than others and this can be frustrating if you are ready to discuss at the beginning of the week and no one else is there.

The asynchronous discussions created a *temporal* and *spatial distance* signified by long silences between participants when they were waiting for their group members to respond to get on with the collaborative tasks. The delay forced the participants to wait and postpone their coursework, which aggravated some while others realized the temporal and spatial flexibilities they enjoyed came with a downside when the group work was concerned. Many participants did not have access to the internet all the time, which prevented them from taking part in discussions, depending on their spatial location. To some participants, it also made it more difficult to actively and positively contribute to the collaboration.

I'm used to collaborating at my work where we agree on times to work or answer questions, so the discussion format hinders myself from working when I want to. The fact that you must sometimes wait several hours or days to get a response may bug me. Saying that I expected to have better internet connectivity in the countryside so that I could have written and communicated better. Even though I am not as good at it as I would want to be.

Agential cut 4: Online collaboration as shared and extended knowledge

A good discussion was entangled with several material-discursive practices; *theories* and *practice*, *cognition* and *emotion,* and *personal* and *professional* dimensions. The participants drew on their previous experiences, and they included facts they knew from before or from the course material. Many participants also invited others to share what they knew and what they had learned. Facts became entangled with personal experiences in the written asynchronous communication that ideally was light, fun, or personal, making the discussions interesting and easy to learn from and relate to. It created an important connection within the group at a distance because they showed each other consideration and invited the others to join in the discussions by being friendly, funny, or personal.

The best kind of discussion (in the course, Personal leadership discussions were hands down amazing, and we all learned a lot) is when everyone participates because it is easy and you can contribute with own experiences mixed with facts; this way, you get a lot of different perspectives and keep it light - then, it's easy (and fun) to comment and actually DISCUSS; not just post a bunch of facts in a thread. This is why when I comment, I try to ask something from the others, in the end, to make it easier for them to write something because they can start with answering a question. I feel sad that the first discussion wasn't a success.

The online discussions exemplified *entanglements* between *the human* (the participants) and the *non-human* (assignments, course content) agents. Through other participants' perspectives/actions/responses/feelings, the human actors became part of an extended and shared knowledge practice. They gained access to new worlds the participants would not normally become part of. Together they unfolded personal and course matters by reading what others wrote and actively taking part in the discussion threads. In a sense, they reshaped the course content through the many perspectives available within the group as they moved within the virtual space through their posts. An interesting spatial matter unfolded in the discussions as the collaboration extended to spaces outside itslearning and into the lives and locations of the participants.

> *It's a great way to communicate with various people about the given topics. The discussions have included interesting insights and suggestions that broadens my own thinking. Online collaboration in discussion forums is less meaningful if the participants aren't active. One of the reasons for my active participation in the discussions is that it's fascinating to communicate with various people and to discuss subjects that aren't necessarily the ones discussed with my friends outside of the course or the school. It's interesting to see how they feel and respond to my posts and also how the discussion develops. I hope that I can bring some insights based on my experiences and opinions, that adds to the discussion. Also, by being an active team member, I hope that other students will get more out of the collaboration., That there are as many opinions as there are people. Also, there are a lot of viewpoints that I haven't thought of before someone has brought it up in the discussion.*

Agential cut 5: The paradox of online collaboration

The *temporal* and *spatial* entanglements highlighted a paradox with online collaboration. The participants wanted to collaborate with people online because it was flexible and because they wanted to meet and learn from people from different parts of the country with different backgrounds. They were open to the possibilities of collaboration from the start. Many participants invited group members to extend and challenge their previous knowledge. They also wanted to or had to work/travel and take part in the course in their own time. It meant they could not be tied up to a shared timetable. However, the participants perceived a shared timetable as necessary when decisions needed to be made within a short timeframe brought on by course deadlines or as a way to establish relations between group members. The participants generally agreed on the spatial issues with the open group discussions and the extensive flow of information during the course. Many participants complained of a lack of communication within their groups that halted or disturbed the collaboration. This dissonance suggests the *material-discursive practices* (course design) concerning collaboration did not support all groups. Successful group work seemed incidental and based on if groups happened to have active and engaged members that included everyone in the discussions.

> *I like the way it gives me an opportunity to collaborate with people who come from different schools in Finland. What I find less meaningful is the fact that online collaboration brings challenges with communication. Communicating on Facebook or WhatsApp isn't always working because not everyone can be on a computer all the time, and that way, not everyone can participate in decisions. What makes me very hesitant to participate in the discussion is the fact that this course has extremely many folders and it is really hard to keep up with every assignment and discussion. What makes me eager to join the conversation is that the people in my group were very nice. I hope that my post on LinkedIn would raise interest and questions and obviously some discussion around the topic. Well, so far, I can't name a specific skill I've learned, but at least my attitude became more positive towards online collaboration. Before I thought that it is not an effective way to study.*

6. Discussion

This study investigated spatial and temporal entanglements in student collaboration in a Virtual Learning Environment. Posthumanist *Bildung* (Taylor, 2017) was used while analyzing the data. The following questions will now be addressed: In what ways are space, time, and student collaboration entangled in the Virtual Learning Environment? What effects do these entanglements produce in the material-discursive practices during the course? The diffractive analysis identified entanglements within the collaboration relating to *spatiality* and *temporality* in the online summer course that lasted five weeks. The participants were working full-time or traveling while completing the course. Their entangled personal, professional, and study lives created moments of focus or concentration when they were free or had access to the internet. The course timeline became a temporal agent as it created stress or focus among participants with its deadlines. The Virtual Learning Environment (itslearning) became a spatial agent in the collaboration because of the design of the discussion forums and the course page that created a flow of digital information deeply entangled with what the participants knew, did, and felt.

In five agential cuts, we have opened up spatial (e.g., online, written posts) and temporal (e.g., flexibility, deadlines, delayed communication) entanglements in the Virtual Learning Environment. The participants wanted to take part in the course anytime and anyplace. The asynchronous communication forced participants to wait for replies and respect the timetables of the group members. In some cases, it created time for better replies and comments and time to read the course material in relation to the discussions. In other cases, the delayed communication put a strain on the collaborative processes as participants were waiting for their group members to join them. The asynchronous communication also created a disconnection within many groups because there was a delay in communication, which is in line with previous research on online collaboration (cf Falloon, 2011; Hrastinski, 2008; Weller, 2007).

The participants wanted to take part in the course for different (e.g., theoretical/practical, cognitive/emotional, and personal/professional) reasons, and these entanglements were also enacted when participants communicated with others. Personal development was supported by online collaboration, which is in line with previous research (Cabrera et al., 2002). From a posthumanist *Bildung* viewpoint, the participants were looking to extend their "knowledge-in-becoming" (Taylor, 2017, p. 433) through the personal experiences, the course content, and the knowledge group members shared. Knowledge became something produced between the participants and between the participants and the technology provided. The participants respected the views of the group members and learned much with them. They also wanted to extend that same "knowledge-in-becoming" to their group members by offering their perspectives on the topics discussed. Many participants wanted to empower everybody in their group. In their communication, they related to one another and showed consideration for one another.

Spatial issues with the course page's design on itslearning were entangled with participants' actions or inactions. The participants felt overwhelmed or confused by the information when 240 participants were adding posts every day. This partly confirms the critique by Harasim (2012) and Weller (2007) that online spaces are not necessarily designed to support different collaboration phases. In this study, the participants wanted hidden group folders to ease and focus the collaboration. The discussion threads seemed to support relationships and "knowledging" (Taylor, 2017, p. 430) in many groups. Written asynchronous communication supported the participants' agency as it was easy to follow the discussions, reflect on posts, and build on what others had written when participants had time to do so, which is in line with previous research (Holmer et al., 2009).

In this study, participants missed meeting face-to-face to collaborate, and they felt that written communication limited the possibilities to reach shared decisions, get to know each other, and execute the group assignments effectively. Some groups managed this issue by using instant messages (e.g., WhatsApp, Messenger). Videoconferencing may support online collaboration through its temporal immediateness. However, it requires shared time frames, spaces, and access to the internet that may be difficult to combine with the desire and need for flexibility, as expressed by most participants in this study. This was the paradox with online collaboration that may

be important to address in the course design and with participants. Adding synchronous communication tools to the Virtual Learning Environment would allow groups to take action in the online collaboration depending on the assignments. As Oztok et al. (2013) point out, online participants generally use asynchronous and synchronous tools in combination and for different purposes.

Setting up groups with active course participants would be one way to avoid passive participants. At the start of a course, teachers may need to be specific about the importance of active participation for all group members' sake to include ethical considerations as part of the collaboration. Teachers can support groups to decide a pace that works for them to make the discussions inclusive and focused spatially and temporally. This way, group members would know when to expect replies and check in on the discussion forum. Temporal cues like deadlines are other ways for teachers to encourage active participation and create a structure for those who need it to get started with the course work.

The collaboration in this study was produced in the relations between the participants and a personal kind of asynchronous communication that was inviting, welcoming, and factually relevant. The participants appreciated comments that were built on what had already been written in other posts. Discussions were not about stating facts or adding unrelated comments. Good online discussions meant adding to the collaboration by including personal experience, relevant course content, and new perspectives in the comments. The discussions included different kinds of entanglements of being/knowing/doing (Taylor, 2017). This can be compared with Samuels-Peretz's study (2014), where relevant content and constructive comments were important for the participants, and in the best-case scenario, the online discussions gave them a voice of their own.

In this study, many groups never established relations between group members. Discussions often included a few active group members. We agree with Samuels-Peretz (2014) that guidelines for online communication may support participants taking part in online discussions. Relationships and a sense of belonging are not easily established in online environments. They build on active and meaningful participation from the teachers, tutors, and other learners (cf Cherney et al., 2018; Peacock et al., 2020). Furthermore, it is important to design the space for collaboration *and* the assignments for collaboration to provide easy access to information and shared spaces. Otherwise, participants may be overwhelmed or hesitant about how to take action in the Virtual Learning Environment.

Future studies and limitations

In future studies, a lack of communication and collaboration would be important to investigate (Barkley et al., 2014). This study suggests that participants may be disinclined to take part in online collaboration if group members are inactive. At the same time, it presents an interesting paradox; other participants may also be waiting for someone else to write the first comment, which delays the collaborative processes. It confirms the importance of a good dialogue within the group relating to how they respond and act towards each other. The course design can produce guidelines that open up collaboration as shared and extended ways of knowing, being and acting together. Addressing the complexities of distance education to make it more inclusive, meaningful, and relevant in the digital age is something posthuman perspectives can help with (Bayley, 2018; Braidotti, 2019).

The posthumanist *Bildung* framework helped to dissolve dichotomies between, for example, personal/professional, content/method, time/space to open up new patterns in the data besides the well-known issues with online collaboration (i.e., lack of interpersonal skills, lack of guidelines, problems with group dynamics) (see, Barkley et al., 2014). Simultaneously, much theoretical and empirical work remains when it comes to the myriad of concepts related to posthumanist *Bildung* and their empirical implications. Posthumanist *Bildung* is a reasonably new concept introduced in 2017 by Carol Taylor. We encourage the reader(s) to remain open to the many question marks this study leaves us with. *Bildung* falls back on a number of traditions that have been debated for a long time. Posthumanist *Bildung* is just one of many ways forward. It is a way that cherishes and empowers relations between humans, non-humans, and more-than-humans to make the future better for multiple others (Bayley, 2018; Braidotti,

2019). This means *knowing, being,* and *doing better* by accepting entanglements and relations relevant to educational practices.

Conclusions

This study has wondered about asynchronous collaboration in Virtual Learning Environments with the help of posthumanist *Bildung* (Taylor, 2017). Spatial (e.g., discussion threads, online posts, digital information) and temporal (e.g., flexibility, deadlines, delayed communication) matters became entangled with the material-discursive practices of the course (course content, assignments, method) and the personal and professional lives of the participants. The participants shaped and reshaped the collaboration by entangling themselves with course materials, personal experiences, and the experiences and knowledges of the group members in their online posts. It meant active and empowering processes open to multiple others and knowledge as shared and extended between people, time, and spaces (Braidotti, 2019). Collaboration in Virtual Learning Environments can involve many entanglements (e.g., cognitive/emotional, theoretical/practical, personal/professional) that matter and are meaningful to the participant. These processes are produced in relation to other people and to the time and technologies available.

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LOCKDOWN AREA OF COVID-19: HOW DOES CARTOON BASED E-CONTENTS EFFECT ON LEARNING PERFORMANCE OF INDIAN ELEMENTARY SCHOOL STUDENTS WITH ADHD

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ABSTRACT
In the context of the lockdown area of COVID-19, animated and gag cartoon-based intervention has a significant role in promoting students' learning performance at elementary levels. ICT-based intervention on students with ADHD mostly uses in UK, USA, Greece, Iran, and Poland. Still, recent researches are conducting in India, especially in the Northeastern region, to assess its effectiveness. Based on the literature and research questions, the current study aimed to evaluate the effect of animated and gag cartoon-based e-contents intervention on experimental groups' learning performance with those in the comparison group in Silchar town, Assam. 90 students with ADHD were assigned to experimental groups and a comparison group. The experimental group I (n=30, age ranged 10.5-11.5 SD= 11) was exposed to animated cartoon based e-contents instruction, and experimental group II (n=30, age ranged 10.5-11.5 SD= 11) was assigned to gag cartoon based e-contents in Environmental studies. Simultaneously, the traditional approach was used in the comparison group (n=30, age ranged 10.5-11.5 SD= 11). The quasi-experimental design was used to examine the effect of animated and gag cartoon-based e-contents intervention on experimental groups' learning performance with those in the comparison group. It resulted in animated cartoon-based e-contents and gag cartoon-based e-content intervention that significantly affected participants' performance over the comparison group.
Keywords: animated cartoon based e-contents; attention deficit hyperactivity disorder, gag cartoon based e-content; learning performance of students

INTRODUCTION

Recently, the authority of different countries closed the formal elementary schools to stop the infection of deadly corona virus. UNO and WHO also advising the people and the authorities of school and higher educational institutions to stop the informal education system rather continue education through online platforms. In this COVID-19 era, social distancing and using of mask is important to stay safe from outbreak of corona virus. In the last two decades, ICTs is used by the teachers in the teaching and learning process and improved the performance of students in the teaching-learning process (Jena *et al.,* 2017). Literature found that students with Attention Deficit Hyperactive Disorder (ADHD) became normal after being exposed to cartoons or video games. Their performance becomes quite similar to the students without ADHD (Xu *et al.,* 2002), and cartoons reduce distraction and sustain attention for a prolonged time (Arunraj & Blessy, 2015). Similarly, animated cartoon use while teaching encourages the students to learn any complicated subject matter quickly (Mtebe & Twaakyondo, 2012) and grasp the students' attention with ADHD through motion and images (Govindaraj, 2012). Also, Muthuchamy & Arunraj (2013) found from their study that cartoon has a significant positive effect on children as it creates a humorous environment where they are able to learn contents easily, respond to any queries, enjoy classroom situation and can react to any stimuli whether it may be alone or with friends in a small or large group. However, watching cartoons on television reflects a long attention span in children with ADHD (American academy of pediatrics, 2000). It is also found that the maximum number of students with ADHD who have the problem of inattention and other associated behavioral problems have difficulties with a concentration in the classroom. And hinder them in completion of their classwork, homework or any assignments given to them (DuPaul *et al.,* 2008) and as a result of which their performance in tests and exams are deficient, that lead to a lower grade in academic and poor schooling (Shillingford, *et al.,* 2007; Loe & Feldman, 2007). Moreover, they often show lower performance in reading and calculation (Frazier et al., 2007) and weak written expression (Mayes & Calhoun, 2006) due to their inattentive symptoms (Todd et al., 2002). Similarly, two more studies have revealed that students with ADHD often face difficulty managing and maintaining social relationships, low

social adjustment, and poor communication. ADHD students have lack of interpersonal skills, psychological problems, drug abuse, consuming alcohol, and low self-esteem (Bakhshani *et al.,* 2011; Green & Rabiner, 2016). So, in light of the harmful consequences of ADHD, several findings suggest that the students with ADHD need novel and effective interventions addressed to their academic difficulties (DuPaul, 2007), which may be a cartoon-based e-content intervention.

TYPES AND SYMPTOMS OF ADHD

There are mainly three subtypes of ADHD, according to DSM-V (2013). These are Inattentive Presentation, Hyperactive-Impulsive Presentation, and ADHD Combined Presentation along with their symptoms; these are briefly discussed below.

Predominantly Inattentive Presentation

The children, including this category, maybe characterized by difficulties with concentration, inability to focus, and pay attention. They also face problems organizing tasks and time management and often forget and lose the materials necessary for any activities. The children belonging to this category don't listen to others while spoken to them directly and often avoid engaging in any activities that require mental effort such as homework, school work, etc.

Predominantly Hyperactive/Impulsive Presentation

The children under this category often have difficulty awaiting their turns, blurting out answers too quickly before the questions have been completed, disruptive classroom behavior, interrupt others' conversation, activities, rejection by classmates, and often talks excessively. They usually run and climb excessively in which it is inappropriate and frequently fidgets with hands or feet.

Predominantly Combined Presentation

The children under the predominantly combined presentation this category show both inattention and hyperactivity-impulsive behavior.

REVIEW OF CARTOON BASED E-CONTENTS AND LEARNING PERFORMANCE OF STUDENTS WITH ADHD

To carry out the present study, the researcher reviewed more than 50 literature related ICTs in general, and cartoon-based intervention applied explicitly to students with ADHD (Arunraj & Blessy, 2015; DuPaul *et al.,* 2008; Mautone *et al.,* 2005). It is found that there has a significant relationship between using cartoon based e-content approach and the academic performance of students with ADHD (Govindaraj, 2017; Muthuchamy & Arunraj, 2013). Most of the studies were evaluated the effects of ICT on the learning performance of students with ADHD, and those were mainly conducted in UK, USA, Greece, Iran, Poland, and other parts of nations. However, few researches were undertaken research on the cartoon based intervention in India, especially in the North-Eastern region (Andreou *et al.,* 2016; Christina *et al.,* 2004; Mautone *et al.,* 2005; Shaw & Lewis, 2005). Two case studies were conducted in Tamilnadu, India found that the use of cartoon in learning environment provides the opportunity for active participation in children with ADHD, which helps them improve difficulties of attention and construct their knowledge meaningfully and permanently (Arunraj & Blessy, 2015). Whereas another study indicated, Animated Learning Package for Mathematical subjects helps students with ADHD enhance their learning, achievement, and reduction of ADHD symptoms (Govindaraj, 2012). Similarly, Eker & Karadeniz (2014) found that cartoon can be used in teaching practices that provide significant improvement in academic achievement and reduce anxiety and tension in students of the experimental group. Moreover, two more research findings indicated that the application of cartoon in the teaching-learning process helps create a learning environment by giving the students the freedom to explore their creativity (Al-Rabaani & Al-AAmri, 2017; Ross, 2012; Mtebe & Twaakyondo, 2012). Animation content improved mathematical abilities in students far better than the traditional approach (Rohendi, 2012). Also, animated cartoon could be used to help children with ADHD gain various skills, several visual and spatial reasoning tasks, and communication with parents, teachers, siblings, friends, or others (Srinivasalu, 2016). As most children favor cartoons, the images are well absorbed in the eye and the brain (Ozay, 2013). So, to enhance the level of attention and to improve academic achievement, cartoon can be used in teaching Environmental Studies among students with ADHD, particularly

(Jena & Gupta, 2019). The researchers assessed the cartoon-based intervention's effect on students' learning performance with ADHD in Environmental Studies at elementary schools in Silchar Town, Assam, India.

GLOBAL NOVELTY OF THE STUDY

Based on the literature reviewed, most of the studies found that ICTs has a significant impact on the academic improvement of students over the conventional approach (Andreou, Riga, & Papayiannis, 2016; Jena, 2015; Riga & Andreou, 2018; Stern *et al.,* 2016). A question arises whether the animated cartoon is significant compared to the conventional approach to students' learning performance with ADHD. In the last four decades, various commissions have emphasized on joyful learning. In support of these ideologies, the National Curriculum Framework (NCF) 2005, and New Education Policy 2019 were highly emphasized on learning by the activity-based approach incorporated with ICT. Yet, no policy has especially been developed for students with ADHD. The researcher is trying to share the study findings through different policy decisions; those can be reflected in curriculum and instruction. Moreover, the Government of India approved to establish ICT or technology-enabled classroom in government schools, and cartoon based instruction can be implemented only with ICT. So, the policymaker, curriculum framer, and stakeholders should keep keen attention to develop e-contents in support of cartoons in Environmental Studies. Besides, different orientation programs, conferences, workshops, etc. should be organized at the primary and secondary level to train the teachers on how to operate cartoon based instruction and how to develop cartoon based e-contents. The authors examined the effectiveness of cartoon based e-contents on students with ADHD in Environmental Studies at the elementary level in Silchar, Assam.

RESEARCH QUESTION

In this study, we compared the effect of animated and gag cartoon-based e-contents intervention on the experimental group's learning performance with those in the comparison group in Silchar town, Assam. There are contradictive results about the effects of simulations on students' conceptual understanding and inquiry skills. Although some of them (e.g., Al-Rabaani & Al-AAmri, 2017; Christina, *et al.,* 2004; DuPaul & Weyandt, 2006) found that animated and gag cartoon based e-contents intervention provided a significant impact on knowledge and inquiry acquisition. Some others reached and found that the traditional approach gave better outcomes than animated and gag cartoon based e-contents intervention simulation-based instruction (Loe & Feldman,2007). Most of these studies claim that the effectiveness of animated and gag cartoon based e-contents intervention in science education depends on the topic taught by the animated and gag cartoon based e-contents intervention, the learners, and the science teachers. In the current study, we used the same animated and gag cartoon based e-contents intervention to teach the Environmental lessons for elementary school to the students with ADHD backgrounds in the practical classes. In this way, we tried to investigate the animated and gag cartoon based e-contents intervention over the conventional approaches. The following research questions were investigated in the study:

- Whether the cartoon-based e-contents intervention is effective for students with ADHD on their learning performance in Environmental Studies belonging to Assam's elementary schools?

OBJECTIVE

To assess the effect of animated and gag cartoon-based e-contents intervention on the experimental group's learning performance with those in the comparison group in Silchar town, Assam.

HYPOTHESIS

Animated and gag cartoon-based e-contents training students with ADHD in association with those in the comparison group, will demonstrate better in their Environmental Science learning performance.

METHODOLOGY

Participants

The study examined the effect of cartoon-based e-contents on the learning performance of students with ADHD. For that purpose, the authors selected three English medium schools affiliated to CBSE and the students with ADHD of Class V in Silchar town, Assam, India. The study participants were 90 students with ADHD who were assigned to two experimental groups and a comparison group. The experimental group I (n=30, age ranged

10.5-11.5 SD= 11) was exposed to animated cartoon based e-contents instruction, and experimental group II (n=30, age ranged 10.5-11.5 SD= 11) was assigned to gag cartoon based e-contents in Environmental studies. Simultaneously, the conventional approach was used in the comparison group (n=30, age ranged 10.5-11.5 SD= 11).

Design of the study

We used a quasi-experimental design while all the participants of three groups were assigned to the pretest. After a four-month intervention with cartoon-based e-contents, participants were again assigned to posttest. Animated cartoon based e-content intervention was exposed to the experimental group I (n=30) and experimental group II (n=30) who were treated with gag cartoon based e-contents but a conventional discussion approach was assigned to the comparison group (n=30). Moreover, for minimizing extraneous variables, equivalent group design, and statistical technique (ANCOVA) was used.

Instrumentations

1) ADHD Diagnostic Teacher's Rating Scale

By following the guidelines of the Diagnostic Statistical Manual of Mental Disorder-5 (2013) of APA, the researchers developed an ADHD diagnostic teacher rating scale to recognize the symptoms of ADHD among students. The scale comprised 18 statements (having 0-3 score) consisting of four options, namely Never, Occasionally, Often, and Very Often. The scale was categorised into three core subtypes of ADHD i.e. predominantly inattentive presentation included 1-9 statements, predominantly inattentive/hyperactivity presentation included 10-18 statements and the combined presentation included the statements from both mentioned subtypes. The test-retest reliability and Cronbach's Alpha of *ADHD Diagnostic Teacher's Rating Scale were .99 and* .98. It took maximum of 20 minutes to respond to the complete statements of the rating scale.

2) Achievement Test in Environmental Studies

An achievement test in Environmental Studies for class V affiliated to CBSE schools was developed by following the standard guideline of test construction. After discussing with the school administration, the contents were selected, and accordingly, the blueprint was prepared with proper domain and weightage to the test items (*see* box1). Fifty multiple-choice items having four options were prepared to examine students' learning performance with ADHD in Environmental Studies. The content validity ratio of the Achievement Test in Environmental Studies was (.81). Simultaneously, the test-retest reliability and Cronbach's Alpha was .88 and .87 respectively was estimated, and a maximum of 15-17 minutes required to respond to the whole items.

Box-1 contents of Environmental Studies for Class V

Class	Chapter	Name of the chapter	Concepts
V	I	Supersenses	Has this ever happened to you, Why so?, Sound send message, Sloth,
	II	A Snake Charmer's story	I am Aryanath, Dadaji remember
	III	From Tasting to Digesting	Different tastes, Straight from the heart, Nitu was given a glucose drip, Story-A stomach with a window
	IV	Mangoes Round the Year	Biji returned the bread, Summer treat- Mamidi tandra
	V	Seeds and Seeds	Plants which hunt, Wandering seeds, Who came from where?
	VI	Every Drop Counts	Customs related to water
	VII	Experiments with Water	What float- what sinks? Dead sea, Dandi march
	VIII	A Treat for Mosquitoes	Blood test, Anaemia-What's that?, Baby mosquitoes
	IX	Up You Go!	Mountaineering camp, A funny incident, A special guest, Camp in the snow
	X	Sunita in Space	Straight from the heart, Talking with Sunita,

PROCEDURE OF EXPERIMENT AND DATA COLLECTION

We assessed the animated cartoon-based e-contents intervention's effectiveness on students' learning performance with ADHD in Environmental Studies. ADHD Diagnostic Teacher's Rating Scale was applied to select the students with ADHD of Class V of three schools were assigned to experimental groups and comparison groups randomly. After identifying and assigning to the particular group, they were pretested. After six months of intervention, post-tested was assigned to assess the effectiveness of cartoon based e-content intervention over the conventional approach.

Activity I: Animated cartoon based e-contents intervention to students with ADHD

Before the beginning of lockdown due to COVID-19, ADHD Diagnostic Teacher's Rating Scale was used to identify the participants with ADHD, allocated to the experimental group I for gag cartoon based e-contents intervention. After a few days, lockdown enforced in the country, and the online instruction was provided to the students. Before providing the intervention, the participants were assigned to a short duration of training on the animated cartoon based e-contents intervention for its familiarization (*see supplementary material 1- series of cartoon clips of "Tasting to Digesting"*) trough Google meet. Before the actual intervention, the participants were pretested and assessed to know their previous knowledge through an online achievement test. After three months of intervention, a posttest was administered to evaluate their learning performance in Environmental Studies and the effectiveness of animated cartoon based e-content intervention.

Activity II: Gag cartoon based e-contents intervention to students with ADHD

Before the beginning of lockdown due to COVID-19, ADHD Diagnostic Teacher's Rating Scale was used to select the participants with ADHD who were assigned to school II allocated to experimental group II for animated cartoon based e-contents intervention. After a few days, lockdown enforced in the country, and the online instruction was provided to the students. Before the intervention, a short duration of training on the animated cartoon based e-contents was provided for their familiarization. Before the actual intervention, the participants were online pretested to assess their previous knowledge through an achievement test. According to the course and contents, animated cartoon based e-contents were prepared and visualized with proper feedback. (*see supplementary material II- the cartoon clips*). After the intervention, posttest was administered to assess their learning performance in Environmental Studies and assess the effectiveness of animated cartoon-based e-content intervention.

Activity III: Conventional discussion approach to the students with ADHD

Similar to two experimental groups, ADHD Diagnostic Teacher's Rating Scale *also used* to identify the students with ADHD of Class V in school III and assigned to the comparison group. The traditional intervention was provided to students for four months to teach the contents prescribed in the syllabus and the textbook of class V. Before instruction, pretest, and after instruction, posttest was administered to assess the learning performance in Environmental Studies.

ANALYSIS AND RESULTS

We assumed earlier that animated and gag cartoon-based e-contents training students with ADHD will demonstrate better in their Environmental Science learning performance over the comparison group.

H1: Animated and gag cartoon-based e-contents training students with ADHD, in association with those in the comparison group, will demonstrate better in their Environmental Science learning performance.

Table 1 descriptive statistics of experimental group I, II and comparison group

Group	Intervention	N		Pretest	Posttest
Experimental Group I	Animated cartoon based e-contents intervention	30	Mean	9.60	37.03
			SD	1.276	2.553
Experimental Group II	Gag cartoon based e-contents intervention	30	Mean	9.77	28.53
			SD	1.251	5.002
Comparison Group	No cartoon based intervention	30	Mean	9.70	21.47
			SD	1.179	1.349

Table 1 reveals the estimate of animated cartoon based e-contents intervention; gag cartoon based e-content intervention with the comparison group of participants. The pretest means and SD of Animated cartoon based e-contents intervention and Gag cartoon based e-content intervention groups, and comparison group participants was 9.60±1.276, 9.77 ±1.251, and 9.70±1.179, respectively. The average post-test performance of the participants of animated cartoon based e-contents intervention group was (mean= 37.03 & SD = 2.553) while Gag cartoon based e-content intervention group was (mean=28.53 & SD=5.002). However, the posttest learning performance of the comparison group (mean= 21.47 & SD= 1.349) was lower than both animated cartoon based e-contents intervention and gag cartoon based e-content intervention group.

Figure 3 Histogram of pretest posttest score of experimental group I, II and comparison group

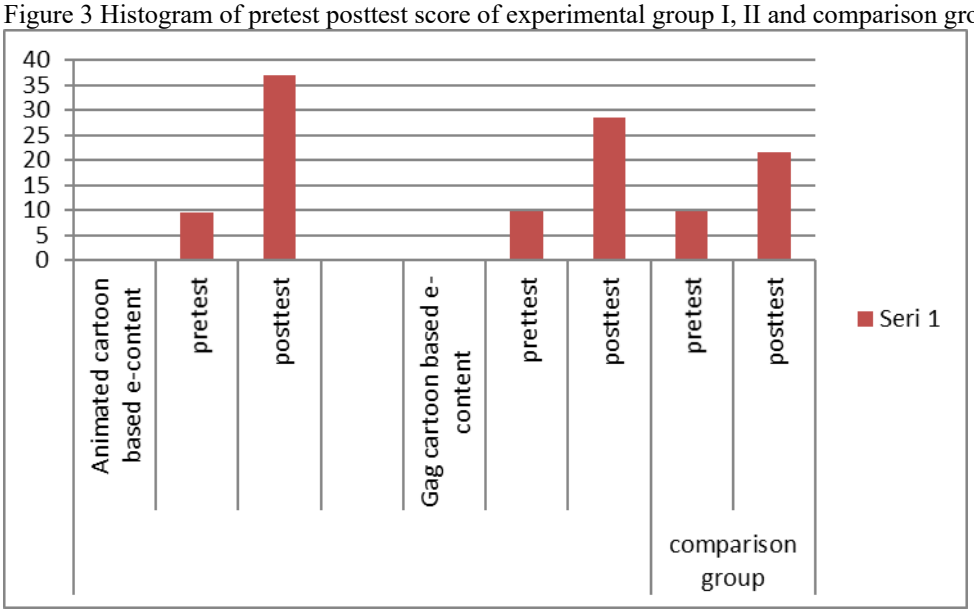


Figure 3 interprets the mean of pretest, posttest score of animated cartoon based e-contents, and gag cartoon based e-content intervention over the comparison group. It was shown that the distribution in the histogram on the same ordinate axis, the posttest scores of animated cartoon based e-contents and Gag cartoon based e-content intervention was higher than the conventional approach of teaching. Y-axis represents the mean posttest score of animated cartoon-based e-contents intervention group, gag cartoon-based e-content intervention, and the comparison group (37.03, 28.53 & 21.47).

Table 2 Univariate factorial ANCOVA for Dependent Variable: posttest score and covariate: pretest score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	4206.237	5	841.247	70.197	.000	.807
Intercept	1349.505	1	1349.505	112.608	.000	.573
Group	.000	0	.	.	.	.000
Intervention	.000	0	.	.	.	.000
pretest score	9.320	1	9.320	.778	.380	.009
Group * Intervention * pretest score	11.645	2	5.822	.486	.617	.011
Error	1006.663	84	11.984			
Total	79001.000	90				
Corrected Total	5212.900	89				

Table 2 reveals the effects of animated cartoon based e-contents intervention and Gag cartoon based e-content intervention over the comparison group. The ANCOVA results reported through univariate analysis tests found a significant impact of the animated cartoon-based e-contents intervention and gag cartoon-based e-content intervention on participants' learning performance over the comparison group. The ANCOVA results of the pretest score of three groups was not significant [$F(2, 89) = .778.111, p > .000$], while the learning performance in posttest among the participants of three groups was significant [$F(2,127) = 35.005$, $p = .000$]. The partial Eta Squared value indicated that the effects of animated cartoon based e-contents intervention and Gag cartoon based e-content intervention over the comparison group is high (0.807). Hence, the alternative hypothesis was accepted. Animated and gag cartoon-based e-contents training students with ADHD, in association with those in the comparison group demonstrated better in their Environmental Science learning performance.

Table 3 scheffe test post hoc tests

(I) Intervention	(J) Intervention	Mean Difference (I-J)	SDError	Sig.
Animated cartoon based e-contents intervention	Gag cartoon based e-content intervention	8.422	.896	.000
	No cartoon based intervention	16.648	.895	.000
Gag cartoon based e-content intervention	Animated cartoon based e-contents intervention	-8.422	.896	.000
	No cartoon based intervention	8.226	.895	.000
No cartoon based intervention	Animated cartoon based e-contents intervention	-16.648	.895	.000
	Gag cartoon based e-content intervention	-8.226	.895	.000

Table 3 indicated that the number of errors was significantly higher in the animated cartoon based e-contents intervention condition (M = 8.422, SDE_{Error} = .896) over gag cartoon based e-content intervention than in the other two learning conditions (animated cartoon based e-contents intervention and comparison group) combined (M = 16.648, SD_{Error}= .895). The average number of errors was significantly higher in animated cartoon based e-contents intervention vs. gag cartoon based e-content intervention. However, the number of errors was significantly similar in gag cartoon based e-content intervention vs. animated cartoon based e-contents intervention, and comparison group performance (M=16.648 & SD_{Error}= .895, p= .000) indicated significant.

Table 4 Univariate test where posttest is the dependent variable

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Contrast	4146.615	2	2073.308	173.005	.000	.805
Error	1006.663	84	11.984			

Table 4 shows the univariate test, where posttest is the dependent variable. The F test [F (2,84) = 173.005, p=.000] was significant (*see* table 4). However, the partial Eta squared value indicated that the effects of animated cartoon based e-contents intervention and gag cartoon based e-content intervention over the comparison group was high (0.805).

Table 5 Levene's posttest of equality of error variances of the dependent variable

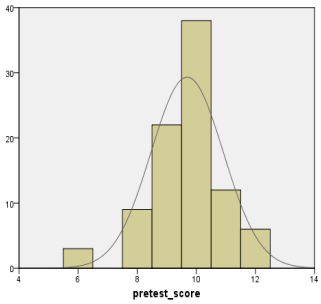
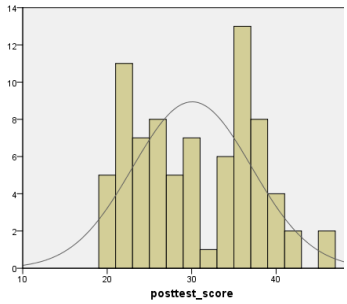
F	df 1	df2	Sig.	Pretest score	Posttest score
.664	5	84	.651		
As p > 0.05, equal variances can be				The residuals are normally distributed	

Table 5 showed Levene's posttest when the pretest of animated cartoon based e-contents intervention and gag cartoon based e-content intervention was significant over the comparison group was included in the model as a covariate. Levene's test resulted in .665 p> .651 was not significant, indicating that the group variances were equal, and the homogeneity of variance was found.

Table 6 Estimated marginal means of posttest score

Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Experimental Group I	36.979	.634	35.719	38.239
Experimental Group II	28.558	.633	27.298	29.817
Comparison Group	20.332	.632	19.075	21.589

Table 6 shows the adjusted means (i.e., controlling for the covariate 'posttest') for each group. This simply means that the effect of 'intervention' has been statistically removed. From these adjusted means, it is clear that experimental group 1 was best after adjusting with covariate of pretest. Table 5 shows that Levene's test showed homogeneity compared with the estimated marginal means in table 6. It showed that the lowest score was achieved by the comparison group (20.332) compared to Experimental group I and II (mean=36.979, 28.558, respectively).

DISCUSSION

The study was initiated to conduct in the Silchar town of Assam before the lockdown era of COVID-19 and during the restriction of COVID-19, schools were closed and students and parents were banned to entry into the campus. During this period, students with ADHD were identified by following the ethical and medical guidelines. It was positive for us that our study involved with online learning. So we continued experiment through online platforms, collected data, prepared report and submitted to this journal. We claimed there was a significant effect of the animated cartoon-based e-contents intervention and gag cartoon-based e-content on participants' performance in environmental Science over the traditional approach. The study area was restricted to Silchar Town, Assam, where Class V of elementary schools were affiliated to CBSE was selected for the experiment. We provided cartoon based e-contents and assessed its effectiveness in the teaching and learning process at elementary levels. In this context, for conducting the experiment, the researchers randomly assigned cartoon based e-contents intervention to experimental groups and convention discussion method to Class V students of elementary schools in Silchar Town. In this lockdown area of COVID-19 phenomena, it was found that the impact of animated and gag cartoon based e-contents intervention has a significant role in promoting the learning performance of students with ADHD in Environmental Studies at elementary levels. This was the first study in Northeast India teachers using e-contents especially, both animated and gag cartoon based e-contents in Environmental Studies for the students with ADHD at elementary schools. However, the study's findings were supported with a few earlier researchers (Arunraj & Blessy, 2015; Andreou, Riga, & Papayiannis, 2016; DuPaul,

Stoner, O'Reilly, 2008; Muthuchamy & Arunraj, 2013; Srinivasalu, 2016). However, the schools in Silchar town, Assam, India, by not wholly technology supported. Therefore, the researcher undertook the study and applied animated and gag cartoon-based e-contents instruction on the internet or online platform by taking consent from these schools' concerned authorities. After four months of instruction through gag and animated cartoon based e-contents instruction, the learning performance of students with ADHD was found much better than the conventional approach. After assessing their retention capacity of six months, various extraneous variables viz. memory, history, maturation, mortality, etc. were minimized using statistical analysis. Cartoon based animated model can improve the standard of education (Al-Rabaani & Al-AAmri, 2017; Ross, 2012; Govindaraj, 2012; Mtebe & Twaakyondo, 2012; Rohendi, 2012). However, based on the present study's findings, we can say that the application of animated cartoon in Environmental Studies lessons has significantly improved students' learning performance with ADHD over the gag cartoon-based e-contents instruction and conventional approach. As a result, cartoon helps create an active learning environment as soon as these students start to look at the images and learn from there. Moreover, it is observed that there was a significant change in conversation or interaction of these students with their peers and teachers, which was quite improved than earlier.

CONCLUSION

The use of cartoon in the educational field during the COVID-19 pandemic has a greater significance at the infancy stage. For upgrading the distance mood of learning in extreme situations, cartoon-based e-contents can be applicable to formal learning during the vacation or in lockdown situations in elementary schools. A lot of schools affiliated to CBSE board in India, especially in Assam has adopted ICT tools in the teaching-learning process during the lockdown era of COVID-19 and therefore, research carried out to assess the effectiveness of cartoon among students with ADHD at the elementary level. In this present COVID-19 phenomena, the cartoon based e-contents instruction strengthens the performance of learning in Environmental Studies among students with ADHD irrespective of their gender, personality, intelligence, socioeconomic status, etc. This cartoon instruction helps the teacher make them competent concerning the content and pedagogical approach required for Environmental Studies. This will help the teachers to improve the quality of teaching and useful learning condition at this level. However, it is also revealed that various stakeholders favored using cartoon for elementary school children with ADHD despite having some disadvantages viz. developing cartoon-based e-content and teacher expertise in using these e-contents. Besides the above findings, it was recommended that appropriate application is mandatory since the proper use of cartoons can further the inclusion of the students with ADHD in innovative educational environments. In this way, both the teachers and students will benefit from developing their content knowledge and having a clear concept about the subject matter. The current study's findings provide awareness to the teachers, parents, and guardians of students with ADHD.

The educational implications of the study are as follows:

1) The study's findings reveal that the cartoon-based e-contents instruction may prove useful but not the panacea for students with ADHD.

2) Teachers may download the cartoon and animation videos from YouTube for the teaching-learning process.

3) The study's findings may be used to develop the tendency of practices, trial, and error habits in ADHD students.

4) The study's outcome showed that cartoon-based e-contents instruction might improve these students' cognitive processes.

5) The study's result revealed that the cartoon and animated based e-contents might be useful in making teachers aware of considering them as an effective teaching-learning material.

6) Various educational institutions may be created such type of cartoon and animated videos and upload on various web portals for users. These videos are helpful as a teaching-learning material to improve the performance of these students.

However, the following are the recommendations put forwarded by the researchers.

1) The present study investigated the effect of the cartoon-based e-content intervention on students' learning performance with ADHD. Still, it needs further research on how cartoon-based instruction influences cognitive development, social skills, problem-solving skills, anxiety, etc. of students with ADHD.
2) It requires further study of how cartoon applies to upper primary and secondary level.
3) It needs to investigate the effect of cartoon-based e-content on the learner's attention, memory, impulsive, and hyperactivity behavior of the students.
4) It requires investigating the impact of cartoon based e-content on the learning performance of non-ADHD students.

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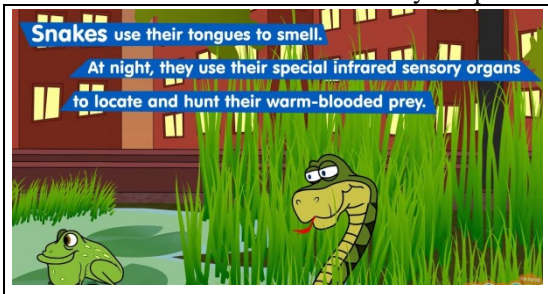
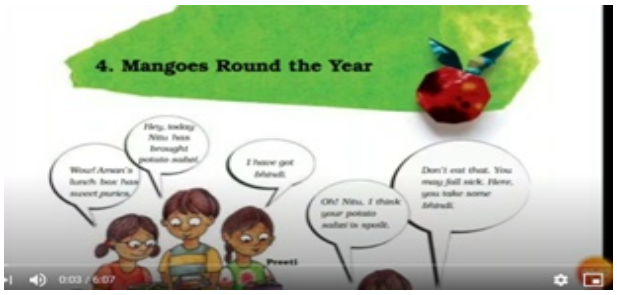
Supplementary material I

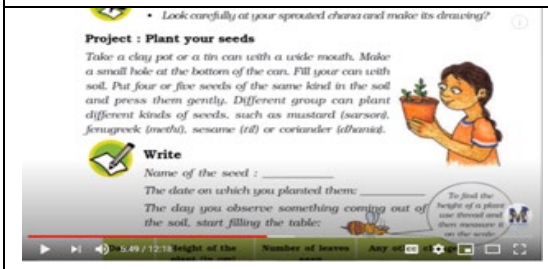
Fig1- series of cartoon clips of "Tasting to Digesting"

Supplementary material II

Fig 2 series of cartoon clips of Super senses A Snake Charmer's story From Tasting to Digesting Mangoes Round the Year Seeds and Seeds Every Drop Counts Experiments with Water and A Treat for Mosquitoes







ONLINE TEACHING-LEARNING DURING COVID-19 PANDEMIC: STUDENTS' PERSPECTIVE

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ABSTRACT
Considering the sudden shift to online teaching due to COVID-19 pandemic, a qualitative survey was conducted on 408 students to uncover their perspectives on online teaching-learning. The data, collected by questionnaire, were analyzed, using percentage and frequency. Results indicated that students were enjoying online learning. Flexibility was found to be the most liked and poor network and connectivity, the most disliked elements of online learning. Adding to it, lack of interaction, distractions and one-sided learning were mentioned as its disadvantages. Online safety and security issues were not addressed and disabled students experienced teachers' negligence and lack of support.
Keywords: Online teaching-learning; COVID-19 pandemic; students' perspective.

1. Introduction

A big concern amid COVID-19 pandemic and the ensuing lockdown is education, which is at standstill affecting learning of millions of students worldwide. In the absence of any medical treatment and vaccine, social distancing emerged as a potent mitigating factor. The public places across nations have been shut to prevent the spread of this deadly disease and amid all, institutionalized education becomes the biggest casualty. Schools and higher education institutions across the globe have been shut, impacting the learning of over 90% of world's student population (UNESCO, 2020). As per UNESCO estimates, COVID-19 related closure impacted the study of 1540 million students across 191 nations (UNESCO, 2020). In India COVID-19 related educational institutions closure affected the learning of over 320 million students (UNESCO, 2020).

Acknowledging the role that education plays in the all-around and inclusive development of individuals as well as nations, learning of learners of all ages and stages must be safeguarded. Thus, as a response government across nations including India emphasized and encouraged the use of online resources to support students' learning. Education through online teaching becomes a new normal for India though it is fairly a very new concept for majority of students and teachers. A sample survey on "Household Consumption on Education in India" conducted by National Statistical Office (NSO) revealed that availability of computers and internet facility was very low in India. Internet facility was available to only 23.8% of India's population (NS0, 2019). As per NSO Sample survey, a huge divide exist between rural and urban population in terms of owing computer and accessing the internet. Only 4.4 % of rural household had computers while 14.4 % had internet facility (NSO, 2019). In urban areas, 23.4 % of households own computers while 42% had internet connections. This weak internet connectivity and lack of wider reach makes learning through online teaching inaccessible, unproductive and unworthy to many Indian students. This infrastructural inaccessibility leads to ineffective and unequal distribution of learning that creates obstacle in providing quality learning for all.

1.1. Online teaching-learning: Students' perspectives

The pandemic- induced lockdown forced colleges and schools to shut down their campuses and amid this a new reality; online teaching has emerged as a potent tool to support students' learning remotely. To continue the wheels of learning, institutions, worldwide, are switching to online mode of teaching and learning. The practical usage of video conferencing platforms such as WebEx, ZOOM, Google Meet, Say Namaste, as well as learning management systems like Moodle, Blackboard etc. have been encouraged to support students' learning in all possible manner during lockdown. However, this abrupt and unexpected shift to online mode of teaching, while internet is available to only 23.8% of India's population (NSO, 2019), and in context where large numbers of learners come from disadvantaged areas or homes, internet accessibility and unaffordable technology is more likely to make learning beyond the reach of many desirous students.

The biggest challenge confronting us is to make learning accessible and worthy to students of all ages and stages in this moment of crisis. Understanding students' practicalities and their preferred ways of learning online helps

us align technology and pedagogy in tune with students' interest and learning preferences. The idea that technology users have clearly defined preferences towards the use of technology, and so adoption of technology is an undoubtedly rational decision (Schoonenboom, 2012). Some people may have strong preference for technology, but this is not the absolute fact. Enthusiastic but uncritical use of technology is not a rarity; use of technology is also regarded as following the trends (Wang, 2010). Some people may be indifferent or may resist technology adoption (Sanford & Oh, 2010).

Many factors influence students' satisfaction with online teaching. This includes interaction between students and teachers, interaction with fellow peers, content, delivery method, technical support and support services. (Roberts et. al., 2005). Technological know-how and certain level of comfort with computer and internet technologies is the prerequisite for learners to benefit from online instructional activities (Motteram & Forrester 2005; Rodriguez, Ooms & Montanez, 2008). Other factors that influence online learning include accessibility and affordability of computers as well as stable internet connection with good speed as supported by many research findings (Atack & Rankin, 2002; Billings et al., 2001; Scollin, 2001). Inaccessibly of computers and internet technologies combined with lack of technical skills may cause computer anxiety (Loyd & Gressard, 1984), and also impairs learning (Cheurprakobkit, Hale, & Olson, 2002). Researchers found that the effective online learning required both access and technical know-how (Rodriguez, Ooms & Montanez, 2008).

Students' satisfaction with online classroom is determined by students' lived experiences of the online classes (Thurmond et.al., 2002). Satisfaction results from quality teaching and learning in online environment. Studies supported time factor as a vital element in online teaching and learning and reflected that flexible study time and use of multiple sources of media to supplement instruction also affected students' online learning (Thurmond et al., 2002; Dawyer, 2003; Rodriguez, Ooms & Montanez, 2008). Interactive and engaging course design by using graphics and text with learners having multiple options to respond also influences students' satisfaction with online learning (Song et al., 2004).

Concerns have also been raised about the opportunities and quality of interaction between instructors and fellow peers being provided in the online platforms (Roblyer & Ekhaml, 2000; Howland & Moore, 2002; Petride, 2002; Vonderwell, 2003). Human to human social connection and relationship is also missing in online learning making learners deprived from the benefits of learning with peers (Vonderwell, 2003; Sit et. al., 2005). Many studies supported the view that lack of direct communication might also cause a feeling of isolation and loneliness among learners using online learning platforms (Bullen, 1998; Hara and Kling, 2000; Zembylas et al., 2008). For students, the biggest advantage of online learning is convenience and flexibility while biggest disadvantage is lack of interaction (Cole, Shelley & Swartz, 2014). Study of Friesen and Kuskis (2013) indicated that improved interaction between learners and instructors might result in increased students' performance, satisfaction with online learning and positive emotions associated with success. Studies showed that students with sense of community in online learning environment often reported higher level of satisfaction and improved learning outcomes (Richardson & Swan, 2003; Moisey, Neu, & Cleveland-Innes, 2008).

On a positive side, online learning environment increases access to material and offer learners flexibility to learn at a pace, place and time suited to them (Chizmar & Walber, 1999; Smith et.al., 2005). E- learning platforms offers students multiple options to access information and communicate with peers and teachers, this flexibility and control makes them self-motivated and self regulated learners (Smith & Limniou, 2010). Online learning platforms also offers enriched learning experiences and help students becomes independent and self-directed learners (Singh, O'Donoghue & Worton 2005). Researches explore that online learning puts the onus of learning on students which increases their sense of responsibility and sense of control over their learning (Howland & Moore, 2002; Holley & Taylor, 2008).

In online learning environment, the traditional classroom lectures are replaced by web-based learning material and resources. As a learning tool, web-based technologies provide students with flexibility to learn at their own pace and at the time most suited to them. ((Heidari & Galvin, 2002; Rouse, 2000; Kozlowski, 2002). Online learning environment also provides students with opportunities to learn the skills of creative thinking and problem solving (Sit et. al., 2005). The online learning designs also encouraged students to be responsible for their own learning and develop competencies and confidence to deal with difficult situations (Sit et. al., 2005). Instructors' accessibility, prompt feedback and clear instructions in terms of performance and learning expectations from students are found to be the key elements of learners' progress in online teaching and learning. (Hara & Kling, 2000).

E-learning platforms make information access convenient. It is found to be flexible in adapting to the needs of learners and its wider reach opens the door of quality learning for many learners (Poole, 2000; Soon et al., 2000; Cuellar, 2002). Online learning platforms develop deep level of understanding about subject matter (Petrides,

2002). It encourages, facilitates and develops creativity and higher level cognitive functioning (Petrides, 2002; Womble, 2008). Online learning is a new, exciting and dynamic experience for the learners which improves their learning as well as their academic performance i.e. their exam results (Smaldino, 1999; Leonard & Guha, 2001). Researches on computer mediated communication indicated that this method positively affected students' learning on both affective and cognitive level (Beauvois, 1992; Warshauer, 1996; Bonk & Cunningham, 1998).
In Indian context, online teaching is a relatively new phenomenon as compared to traditional classroom teaching and this COVID-19 induced sudden lockdown made the transition to online teaching more cumbersome and unworthy to many learners. Meaningful online learning and teaching needs proper planning to cater diverse needs of students. Compromise in this planning leads to unproductive learning, resulting in non-accomplishment of learning objectives and learning outcomes. This sudden but much needed shift lacked this planning and analysis of students' needs and skills. Affordability and accessibility of computer and internet technology to vast majority of India's population combined, with lack of comfort and support; and familiarity with technological tools, may make learning unworthy, time-consuming and stressful to many learners. Online learning has also not undergone the same scrutiny as classroom teaching and researches on online teaching demonstrated mixed results (Ryan et al., 1999; Kenny, 2002; Atack and Rankin, 2002; Kozlowski, 2002). Amid this unprecedented crisis, there is a timely need to assess the efficacy of online learning to see whether the intended objectives of using online learning to support students' learning is achieved or not.

One way to assess and improve the efficacy of online teaching and learning is to understand students' perspectives on online mode of learning and to make changes in teaching-learning process accordingly. What are students' preferred multimedia modes? Students' preferences for online versus classroom teaching; what are students' preferred modes of interaction? Students' preferences regarding content delivery and mode of presentation. Reliable answers to these questions help teachers align content delivery and course material in tune with the students' needs and interest thereby making learning worthy and enjoyable in this moment of crisis. The present study is a humble effort in this regard.

1.2. This Study

The present study is intended to uncover students' perspectives of learning through online mode necessitated due to COVID-19 induced closure. Students' experiences of this new teaching and learning method in this unprecedented time plays a key role in designing online learning experiences joyful and worthy for students. Considering the fact that students' satisfaction with learning experiences can influence their learning (Ramsden, 1991; Espeland & Indrehus, 2003), this study is undertaken to assess online learning experiences of students amid this harsh reality of COVID-19.

Since the pandemic induced lockdown forces many colleges to adopt online instructional mode, it is necessary that this sudden and unexpected transition to online mode makes this new learning experience enjoyable, meaningful and supportive for students' learning. Therefore, to address the aim of the study, following research questions were formulated:

- What are the experiences of students concerning online learning during COVID-19?
- What technological platforms students are using for online learning?
- What are the students' preferred content delivery modes?
- What are the students' perceived advantages and disadvantage of online learning?

2. Methodology

2.1. Design and Sample

A qualitative survey was used to examine the online learning experiences of students from undergraduate teacher training course during COVID-19 crisis. A sample of 408 students from Manipur University, Aligarh Muslim University and their affiliated colleges and centers was selected by using convenient sampling technique. The demographic details of the participants are given in table 1.

Table 1: Demographic Details of Participants

Areas	Categories	Numbers	Percentages
Gender	Male	170	41.7%
	Female	238	58.3%
Area of Residence	Rural	240	58.8%
	Urban	168	41.2%
Age Level	Below 20	0	0
	20-30	362	88.7%
	31-40	40	9.8%
	Above 40	6	1.5%
Disability	Yes	12	2.9%
	No	396	97.1%

2.2. Materials

The experiences of students were collected by using a questionnaire on online learning during COVID-19 outbreak that consists of two sections. First section comprised of demographic details of participants and second section dealt with statements and questions related to their experiences of online learning initiated by their respective institutions and teachers. Both open ended and closed questions were included along with check boxes. The questionnaire was designed considering the ease of responding to the question and inclusion of important points related to online learning such as enjoyment and comfort of online learning, digital platforms and devices used, most liked and disliked elements of online learning, content delivery modes used by teachers and those preferred by students, accessibility of internet, advantages and disadvantages as perceived by students. It was prepared to be appropriate for respondents and relevant to the local context. This questionnaire was prepared in Google Form and sent to participants through emails and social networking sites and apps.

2.3. Data Collection Procedure

Data were collected during mid-April and mid-May, 2020 when all institutions of India had switched to online mode of teaching due to corona virus pandemic. The questionnaire was sent through email and WhatsApp to students with request letter for their responses. It was sent to all enrolled students and 408 responses were received.

2.4. Data Analysis

The collected data were analyzed qualitatively by using frequency and percentages for close ended questions and check boxes. The open ended questions were analyzed using content analysis. The filled narrative responses were read, coded and categorized in different themes as per the words and phrases used by students.

3. Result and Discussion

The total collected responses were 408 in number. To examine the experiences of students concerning online learning and to find out the answers to stated research questions, the findings are presented in the sequence of questions or statements of the questionnaire.

3.1. Enjoyment with online learning during corona virus crisis

Table 2: Enjoyment with Online Learning

Enjoyment	Frequency	Percentage
Yes	292	71.6%
No	116	28.4%

In respect to the first question, majority of students (71.6%) were enjoying online learning initiated by their teachers and institutions (Table 2).It is encouraging to know that students enjoy online learning during this tough time. It means that this innovative way of learning is highly enjoyable for students. This enjoyment may prove to be leading to positive and meaningful learning for students.

3.2. Digital platforms used for online learning

Table 3: Digital platforms used for online learning (n=408)

Digital Platforms	Frequency	Percentage
Zoom	218	53.4%
Google Classroom	102	25%
Google Hangouts	4	1%
WhatsApp	268	65.7%
Facebook	30	7.4%
You Tube	16	4%
Others (Telegram, Edx, Udemy)	4	0.5%

In most cases, institutions might be offering online teaching on different and multiple platforms. Considering this point, students were allowed to choose all platforms they were using. Each frequency and percentage of table 3 was calculated out of total number of responding students. Majority of students (n=268) were using WhatsApp for online learning followed by Zoom (n=218), Google Classroom (n=102) and Facebook (n=30). WhatsApp might be considered as one of the easiest tools to use for asynchronous learning experiences that is flexible and easily accessible and handled by students as well as teachers. The very unfamiliar video conferencing app 'Zoom' made its grip stronger in connection to online teaching and learning in the entire world. On directives of authority, many educational institutions in India started teaching through Zoom. It is reflected through table 3 that 53.4% students were using this app.

3.3. Devices used for online learning

Table 4: Devices used for online learning (n=408)

Devices	Frequency	Percentage
Mobile Phones	400	98%
Computers (PC)	4	1%
Laptops	60	14.7%
Tablets	2	0.5%

Similar to online platforms, students were using different devices for online learning. Therefore, students were asked to respond for all devices they were using. Table 4 shows that out of 408, 400 students were using mobile phones for online learning followed by laptops. Computers and laptops were rarely used by students. It is mentioned earlier also that majority of students do not possess computers and laptops. The reports of NSO (2019) stated that only 4.4% rural and 23.4% urban households own computers.

3.4. Most liked features of online platforms

This open ended question was analyzed using content analysis. The narrative comments were segmented into different categories or themes.

Table 5: Most liked features of online learning platforms (n=408)

Top five most frequently liked features of online learning	Percentage
Flexibility	30%
Accessibility of content materials	25%
Interaction with teachers and peers	22%
Comfort	21%
Self-paced	14.21%

While analyzing the most liked features of online learning platforms, it was revealed that 30% students found it highly flexible in terms of time and place. Its flexibility makes online learning highly demanding. Out of 408, 25% students liked its feature of providing accessibility to content materials. In table 3, it was reflected that Zoom, a video conferencing app, was used by 53.7% students, but in terms of interaction, only 22% students found online learning interactive with peers and teachers. Very few students found online learning interactive in nature. Students' satisfaction with online teaching is related to interaction between students and teachers, interaction with peers (Roberts et. al., 2005). Out of 408, 84 students (21%) found it comfortable to study from home. Regarding comprehensibility of the content, 10.29% agreed on it. Only few students agreed on its feature

of being low cost (5%) and providing clarification of doubts (1.5%). Some narrative of students are given in verbatim:

"It has removed gap among students and teachers even during pandemic. My teachers are trying their best and making all efforts to make all students understand the topic and they plan the entire topic in order to help us to gain mastery on the content as they did in classroom teaching."

"Learning through video conferencing offers real-time learning which is fairly similar to the conventional classroom environment."

"I feel comfortable while learning online. I can learn anytime according to my convenience. I can access materials provided by the teachers. It is highly flexible for me."

"An online class is the new experience for me... We can use it at anytime and anywhere. We can connect many people or the whole class at a time. I am enjoying it."

"Materials given, and the time and energy to go/travel to the classroom every day is removed."

3.5. Most disliked element of online platform they were using

Table 6: Most disliked elements of online platforms

Top five most disliked elements	Percentage
Poor network and connectivity	51%
Distractions	16.71%
Lack of interaction	14%
Poor comprehensibility of content	14%
Lack of support	10.78%

Students were asked to give open responses regarding elements they disliked about online learning platforms they were using. Its analyses revealed that more than 50% students faced connectivity and network related issues while learning online. The mentioned responses highlighted the difficulty to get good internet connection and speed for online classes especially in rural areas. Following it, 16.17% students found online learning very distracting because of elements such as noise, poor management, advertisements, etc. As 98% students were using mobile phone for online learning, they found calls in between classes quite distracting. In frequency, distraction was followed by lack of interaction (14%), poor comprehensibility of content (14%) and lack of support (10.78%). It was further found that few students found it stressful (7.35%), lack of proper electricity (6.37%), inflexibility (5.39%), lack of concentration (2.45%), lack of suitable device (2.45%), irrelevant content (1.96%), negligence (.98%) and no feedback (.49%). Some narrative responses are given in verbatim:

"Our teacher is not fully trained for online teaching...One or two teachers hardly knows how to use the online teaching website/application..Rest is testing on their bad/Home..One of our teacher tried to take online classes on Zoom app only a single time.."

"Network issue; We are not getting connected and mostly I face issue in listening teachers' voice. Sometime two or more students respond at the same time unknowingly and I listen noise only."

"It seemed to have a limit of 45 minutes only per meeting which is quite short as it does not allow us to have an interactive teaching-learning process. Also, there is not enough time for clarification of our doubts and queries."

"The network keeps disconnecting in between the meeting and often the voice breaks due to poor connectivity. Therefore, there are many a times, we don't grasp a single thing in the whole online class session."

"Lack of interaction, no room for clarification of doubts and limitations in expressing one's own opinion."

"Time constraints, limited questioning opportunity."

"What I dislike about this online platform is that we cannot interact directly with the teacher if we want to ask some personal questions."

"Negligence and lack of attention also diverted mind while someone calls or text me."

"Network and audio problem and also not feeling the presence."

It was indicated through analyses that the percentage of students, disliking online learning, was more than the features, they liked about online learning. These points give clear indication that teachers should focus on making online learning interactive, comfortable and accessible to all learners. In addition, distractions should be removed by using appropriate modes. Video lectures or classes must be accompanied by supportive materials in order to clarify students' doubts. Multi-media may also be used to enhance quality of learning by making it interesting and appealing to learners.

3.6. Content delivery modes used by teachers (n=408)

Table 7: Content Delivery Modes adopted by Teachers

Delivery Modes	Percentage
Teacher-made Text Materials	65.2%
Video conferencing	48%
Textbook or Reference book materials	41.7%
Teacher-made video	20.6%
Video from online source	19.1%
Teacher made audio file	14.7%
Audio from internet	2.9%
Others	4%

On use of content delivery modes adopted by teachers or instructors for online teaching, it was disclosed that highest number of students were provided teacher-made text materials (65.2%) followed by video conferencing, textbook reference materials, teacher-made video, video from online sources and teacher made audio file. The least used mode is audio from internet or other sources. Teacher-made texts and videos are generally tailored in correspondence to the needs and specific features of students. That might be the reason for adopting these modes of content delivery by teachers.

3.7. Students' preferred content delivery modes

Table 8: Content Delivery Modes preferred by Students

Delivery Modes	Percentage
Teacher-made Text Materials	53.4%
Teacher-made video	45.6%
Textbook or Reference book materials	44.1%
Video conferencing	35.8%
Video from online source	23%
Teacher made audio file	22.1%
Audio from internet	7.8%
Others	4%

For finding out the students' preferred modes for content delivery, they were asked to select given options. It was revealed through analysis that the most preferred mode of delivery was teacher-made text materials and videos followed by reference materials, video conferencing, video from other sources and teacher made audio. The least preferred mode was found to be audio files from internet. It was encouraging to note that teacher-made text materials and textbook materials were highly preferred and mostly used by teachers. This connection might prove fruitful in productive and effective learning environment. Another point to note is that 48% students were taught by video conferencing whereas only 35.8% students preferred to learn that way. The reason might be connected to poor internet connection and its associated distractions. Video conferencing needs real time classes that makes it less flexible in terms of pace and time. If less preferred modes are continued to be used by teachers, it might create stress and demotivate desirous students to participate in teaching-learning process.

3.8. Comfort with online learning

Table 9: Comfort with Online learning

Comfort	Frequency	Percentage
Yes	294	72.1%
No	114	27.9%

In connection to comfort of learning through online mode, it was found that more than 70% students were comfortable in learning online. Regarding enjoyment and comfort, students indicated positive experiences. Their comfort would lead to productive learning.

3.9. Accessibility of Good Internet Connectivity

Table 10: Accessibility of Good Internet Connectivity

Accessibility	Frequency	Percentage
Yes	194	47.5%
No	214	52.5%

The analysis showed that majority of the students did not have good internet connectivity. This could cause inaccessibility of content materials, poor comprehensibility of the content, distraction and lack of interaction.

3.10. Students' perceived advantages of online learning

Table 11: Advantages of online learning (n=408)

Advantages	Frequency	Percentage
I can learn anytime according to my convenience	212	52%
I can learn from anywhere	254	62.3%
I can access materials provided by instructors	184	45.1%
It is highly flexible for me	108	26.5%
I feel more autonomous while learning online.	92	22.5%
Teachers are more friendly online than face-to-face teaching	64	15.7%
Proper guidance for online safety and security is given	28	6.9%
Others: Save travelling expenses	4	2%

Table 11 shows the analysis of question number 10 regarding students' perceived advantages of online learning. It is reflected that majority of students (62.3%) found the advantage of learning from anywhere. They needed not to step out of their homes for attending classes. That might be the reason that 52.2% students found it comfortable to learn online. Out of 408, 212 students perceived that they could learn anytime according to their convenience. It is understood that video conferencing is real time based and it is used by 48% teachers for online classes. These students could not enjoy anytime aspect of online learning. The rest could enjoy the asynchronous mode of online learning. These advantages were followed by accessibility of materials given by teachers, flexibility, autonomy, friendliness of teachers and economic. Online learning is quite often coupled with cyber security and safety issues. Before switching to online mode of learning, making users aware of cyber security and safety is a prerequisite. It must be highlighted that only 6.9% students were getting proper guidance for online safety and security. It can be said that this sudden shift has compromised the users' security and safety in online environment. Teachers may provide orientation to students regarding online safety and security. In other advantages, students (2%) mentioned about saving of travelling expenses and their time. It was also mentioned that they could learn along with helping their family with household chores.

3.11 Students' perceived disadvantages of online learning

Table 12: Disadvantages of online learning (n=408)

Disadvantages	Frequency	Percentage
Poor connectivity	272	66.7%
Lack of time	78	19.1%
Lack of support	36	8.8%
No opportunity for interaction	128	31.4%
No clarification of doubts and queries	74	18.1%
No supportive materials are provided	30	7.4%
No guidance is given for online platform	32	7.8%
Lack of comprehensibility of the concept	60	14.7%
Learning is teacher directed only	40	9.8%
Learning is one-sided	80	19.6%
Others: Stressful and Technical problem	4	1%

After advantages, students' perceived disadvantages of online learning were also analyzed and shown in table 12. It was found that the major disadvantage was poor connectivity. Online learning mainly depends upon

internet connectivity and if it lacks, learning leads to nowhere. Regarding interaction in online learning, 31.4% students agreed that they did not get opportunity for interaction. Online learning was perceived as one-sided by 19.6% students as majority of the talk was done by teachers only. Students lacked time (19.1%) for online learning and their doubts and queries remained uncleared (18.1%). Nearly 60 students were unable to comprehend the content being taught in online classes. Comprehensibility of content depends upon the medium through which it is sent. Poor connectivity might be one of the causes of students' lack of comprehensibility. Some students pointed out that they lack support, proper guidance and supportive materials from their teachers while learning online. Few students (1%) mentioned other disadvantages such as technical problems and its being stressful. In studies (Bullen, 1998; Hara and Kling, 2000; Zembylas et al., 2008), it was discussed that lack of communication may cause isolation and loneliness among students using online learning platforms. It is suggested to destress students in this time of crisis through less work load, sense of community, proper counselling and regular interaction.

3.12 Use of Online Learning after Outbreak

Table 13: Use of Online Learning after Outbreak

Use of online platform after outbreak	Frequency	Percentage
Yes	222	54.4%
No	186	45.6%

The last question was "Will you prefer to use online learning after outbreak also?" Nearly 46% students answered negatively. The reason might be those problems and disadvantages, students were encountering while attending online classes. Adding to it, online learning may be used as a supplement to offline/face-to-face learning as in the case of blended learning and flipped learning. The complete and only use of online mode of teaching and learning is perceived to be distracting and lacking support and interaction with teachers and fellow peers that makes it less effective and more burdensome. Teaching and learning is considered to be a social act. That element remains missing in fully online learning environment, resulting in poor comprehension and lack of support and interaction.

3.13 Perspective of students with disabilities concerning online learning

Out of 408, 12 students were disabled. In their context, it was revealed that they found it difficult to adjust with online learning as they were neglected by teachers among the group of non-disabled peers. One visually impaired student was contacted by phone to record his responses. He mentioned about teachers' negligence and lack of support along with lack of suitable materials. It became difficult for them to select relevant information out of all textual conversation done by their teachers and peers. They found materials unsuitable for their specific needs and unproductive. They perceived online learning very distracting as it lacked social presence of teachers and peers. Lack of peer support and peer interaction were found to be the perceived disadvantages of online learning. Social support in classes matters a lot for students' learning and unfortunately it lacks in online learning environment. The social component remains absent in online teaching and makes learning more or less devoid of any social context. Teachers must try to understand the specific needs and problems of students with disabilities in order to include them in online learning environment. Education should be suitable for individual students' needs. 'One size fits all' approach may not be used by teachers and instructors because it may result in making learning beyond the reach of many students.

On the basis of the analysis of questionnaire, the study further suggested to create student-centered online learning environment that is conducive and supportive for all learners in order to facilitate their learning and to provide opportunities for interaction through use of different media and activities. It should be flexible for accommodating students with less technological support to grow according to their own pace and convenience.

4. Conclusion & Suggestions

Amidst COVID-19 pandemic, internet has become mitigating tool to rescue education form severe effects of worldwide lockdown and closure. By closing the gates of many educational institutions around the globe, coronavirus pandemic has provided an opportunity to practice digital form of teaching and learning. This much needed but suddenly imposed online teaching started unplanned in hurry to safeguard academic life of millions of students affected by this worldwide pandemic. The analyses of this study showed that students enjoyed learning through online mode, if proper facilities were accessible to them. Flexibility in terms of time and place was found to be most liked feature of online learning. But, at the same time, poor network and connectivity was highly disliked element. Poor connectivity might prove to be the major cause of other disadvantages of online

learning. Based on the findings of this study, it is suggested that necessary technical changes must be made in online learning design to facilitate peer interaction, support and socialization in the online learning environment. Online platforms should be designed in manner that provides opportunities for interaction between teachers-students and students- students because interaction is the key variable that influences the quality of online learning (Phipps, 2015). Collaborative learning method can be used to facilitate interaction among peers, working in groups increase students satisfaction , increases students participation and cultivates social relationship (Tinto, 1997). This study suggested teachers and institutions to strengthen the features liked by their students including involvement and interaction, flexibility, comfort and accessibility of materials and to modify elements that hinder their learning in online environment that include poor network connection, distraction, lack of support and concentration, etc. Further, teachers are suggested to do need-analysis of their students, especially disabled students and to provide instruction accordingly. This study showed that they were neglected in online learning. Regarding interaction in online teaching, it is suggested to integrate multiple media presentation and different activities to make learning more participative for students. Undoubtedly, the major challenge is to make students involved and motivated to learn online where social presence of teachers and peers are lacking. Teachers need to reflect on their adopted techniques and practices and should design it in such a way to match it with students' interest and preferred learning styles. This highly stressful time demands counseling of students on regular interval and to assist them in every possible manner. This study gives insight into the perspective of students regarding online teaching-learning during COVID-19 outbreak. Needless to say that teaching and learning needs to be customized according to the perspective of students and their preferred modes and manners for creating better online learning environment.

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ONLINE TUTORING AND COUNSELLING OF DISTANCE LEARNERS: REDEFINING THE ROLE OF REGIONAL CENTRES AND LEARNER SUPPORT CENTRES IN THE DIGITAL AGE

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ABSTRACT

Counselling and tutoring are the backbone of any educational system whether Conventional or Open and Distance Learning (ODL), and this present scenario of social distancing has brought both the pattern of education on a single platform- Online mode. While the conventional system is struggling to find suitable ways of providing education without losing the ethos, ODL institutions are having the upper hand in dealing with these exceptional circumstances due to their inbuilt, inescapable requirement of using various technologies for the delivery of instruction and supporting their distance learners.

The pandemic of the coronavirus (COVID-19) has been a catalyst in speeding up the shift from face-to-face to online methods of tutoring and counselling distance learners. All Open Universities (OUs) and Directorates of Distance Education (DDEs) have to rethink their operations including redefining the roles and functions of their Regional Centres(RCs) and Learner Support Centres(LSCs), as brick and mortar institutions alone are not sufficient to provide counselling and tutoring support to distance learners in the times ahead.

This paper outlines the various online methods available for ODL institutions to switch over to, for providing effective counselling and tutoring support to their distance learners. An attempt has been made to identify the available technologies; define their characteristics: synchronous/asynchronous, number of learners it can serve, interactivity, etc.; and prepare a matrix on their utilization for different levels and types of tutoring and counselling. The new model that is being proposed will require re-designing the learner support system as such. In this context, the role of Regional Centres (RCs) and Learner Support Centres (LSCs) will need to be redefined. Also, the role of existing academic counsellors will need to be recast.

All the changes proposed by the researchers will completely overhaul the existing ODL system and facilitate the ODL institutions to respond to the need of the hour and make the learners well versed with the skills required for the 21st century.

INTRODUCTION

Open and Distance Learning (ODL) is defined as a system of education in which the learner is separated from the teacher as well as peers- in both space and time, and instruction is provided through self-learning materials (SLMs). Initially, the standard learning package comprised SLM in print, as the master medium, coupled with the broadcasting of audio and video programmes and face-to-face academic counselling conducted at Learner Support Centres. Further, with the evolution of ICT and its adoption in education, there has been a shift from passive methods of instruction towards the use of more interactive media and technology to communicate, disseminate knowledge and engage the distance learners in the teaching-learning process. Thus, there emerged

the introduction of satellite-based two-way audio and one-way video through teleconferencing; interactive radio counselling; two-way video through web-conferencing; two-way communication through email; web-enabled learning through Learning Management System (LMS), Online repositories, Open Educational Resources (OERs), Massive Open and Online Courses (MOOCs), etc. (Srivastava, 2016).

Nevertheless, face-to-face counselling sessions are an important component of the learner support system, organized for both theory and practical courses. The time allotted to face to face counselling sessions is worked out following the nature and type of programme and the total credit weightage of the programme. The credit system has been standardized for the ODL system- a credit (equivalent to thirty study hours on the part of the learner) is the measure of study hours required to complete a course successfully. The courses are of 2, 4, 6 or 8 credits and many courses constitute a programme. There are standard norms laid down concerning the total credit weightage of the programme which is linked to the duration of the programme. As per the laid down norms a programme of six months duration will be of minimum 16 credits; one-year duration of minimum 32 credits, two years of minimum 64 credits and three years of minimum 96 credits. According to procedures, the number of counselling sessions for theory-based courses will be 10 % of the total stipulated time for the course, whereas for a practical course it will be 100% of that stipulated time (Government of India, 2017).

The counselling sessions are organized for distance learners, to provide them avenues for interaction with subject experts (academic counsellors) and peers; as close to their homes as possible. Counselling sessions are not lecture sessions, but sessions aimed at providing academic guidance, tutoring and counselling support to the learners, feedback on performance, facilitate reference work at libraries and develop required skills and competencies for the programme and practical courses (wherever required). In keeping with the flexibility of the ODL system, the learners don't need to attend counselling sessions organized for theory courses but attendance is mandatory in tutorials specially organized for theory courses under the Choice-Based Credit System (CBCS) and in all practical courses where 80% attendance is compulsory for the learners to be eligible to appear in the term-end examination.

To conduct these activities satisfactorily, ODL institutions have adopted a three-tier structure consisting of the Headquarters, Regional Centres (RCs) and Learner Support Centres (LSCs).

To reach out to the distance learners, ODL institutions establish Regional Centres (RCs) within their jurisdictional area which function as OU/ DDE sub-office. These RCs act as an interface of the institution in the region. The roles and responsibilities of an RC are predefined which are: delivery of academic programmes; promotion of ODL system; organization and conduct of learner support services through Learner Support Centres (LSCs); and establishment, maintenance and monitoring of LSCs in its region. RCs also have an important role in staff development activities at the local/State level.

ODL institutions establish LSCs to reach out to distance learners as close to their homes as possible to provide them support services such as face-to-face academic counselling, tutoring, library facilities, etc, basically to enhance their educational and learning experience through interaction with their peers and subject experts/ teachers (known as academic counsellors). According to UGC (ODL) Regulations, 2017 (Government of India, 2017), "Learner Support Centre" means '*a centre established, maintained or recognised by the Higher Educational Institution for advising, counselling, providing an interface between the teachers and the learners, and rendering any academic and any other related service and assistance required by the learners'.* Through LSC, distance learners overcome the feeling of loneliness or being alone. LSC plays a very important role in bringing the learner closer to the university system and to provide her/him a sense of studentship.

An Academic Counsellor can be defined as a qualified teacher in a particular discipline, has teaching experience at a higher education institution (HEI), generally, the faculty member of HEI wherein the LSC is established. Eligibility criteria for an academic counsellor are clearly defined in the UGC (ODL) Regulations, 2017 (Government of India, 2017) i.e. '*No academic staff in the Study Centre or Learner Support Centre shall be appointed who does not fulfil the minimum qualifications as laid down in the University Grants Commission (Minimum Qualifications for Appointment of Teachers and other Academic Staff in the Universities and Colleges*

and Measures for the Maintenance of Standards in Higher Education) Regulations, 2010 as modified from time to time'. Academic counsellors must be acquainted with the characteristics of distance learners and their needs. They can differentiate between the teaching techniques utilized in the conventional system and various techniques and technologies required in the ODL system. They must be aware of the instructional design, have familiarity with the learner-centred approach in a blended mode of learning, can use different delivery media including online and computer-mediated communication, and ICT enabled learning.

University Grants Commission (UGC) also acknowledges the importance of online learning and to maintain the quality in online courses/ programmes, notified the UGC (Online Courses or Programmes) Regulations through Gazette Notification on 4th July 2018. It put more emphasis on taking adequate measures for training and capacity building of its teaching and administrative staff at regular intervals. The UGC (Online programmes/ courses) Regulations (2018) also state that '*Higher Educational Institutions shall provide adequate support for advising, counselling, mentoring and guidance to ensure the best possible learning experience for the learners and there shall be clear guidelines on academic integrity and netiquette (internet etiquette) expectations regarding lesson activities, group discussions, chats and plagiarism'.* This notification also defines 'Self-Learning e-Module' as a modular unit of e-learning material which should be self- explanatory, self-contained, and self-directed for the learner, and amenable to self-evaluation, and enables the learner to acquire the prescribed level of learning in a course of study. It has also suggested some "e-Learning content, namely (a) e-Text Materials, (b) Video Lectures, (c) Audio-Visual interactive material, (d) Virtual Classroom sessions, (e) Audio Podcasts, (f) Virtual Simulation, and (g) Self-Assessment Quizzes or Tests." (GoI, 2018).

In the Digital Age, all HEIs, particularly ODL HEIs, need to harness technologies, to provide counselling and tutoring services to the distance learners on their desktops/devices and remove the physical distance altogether. Paterson, Laajala & Lehtelä (2019) found online counselling as an optimal alternative for face-to-face student-teacher meeting. Iwasaki et al. (2019) also found merit in online tutoring for learners at a distance. Learner support services need to be revamped to provide online services that are instant, accurate and timely anywhere anytime. At the same time online platforms should be created for interaction amongst peers and also with academic counsellors, synchronously and asynchronously, for enhancing motivation levels; to provide feedback; and acquisition of required skills and competencies. Rao (2020) also advocated for the replacement of face-to-face counselling with online tutoring and counselling. However, he advocated the use of digital content in different formats such as audio, video, animations, simulations, virtual labs. etc. during the online counselling sessions. The skills of successful teamwork are regarded as essential in today's work environment. Learners need to be engaged in authentic learning through real-life simulations and experiences, to promote active learning.

HEIs have no other option but to rethink their operations of meeting the requirements of a technology-driven ecosystem. The shift in the educational ecosystem and online programmes will become the commonplace (Mckay et al.,2018). However, the faculty need to ensure appropriate instructional technology suited to such learners. The existing structure of Learner Support Services through Regional Centres and Learner Support Centres need to be re-designed in sync with the adoption of online methods of tutoring and counselling distance learners. Wong, Bonn, Tam, & Wong (2018) in their study found the online counselling more effective than the face to face counselling and thus, propagated for creation of online counselling centres in the educational institutions. Srivastava et al (2020) also found the online counselling very effective during the Pendamic times. Thus, A disruption of the existing system is the need of the hour.

OBJECTIVES

This study is being undertaken with the following objectives:

- To identify the technologies available for online tutoring and counselling;
- To define the characteristics of the identified technologies;
- To prepare a matrix on their utilization for different levels and types of tutoring and counselling;

- To redefine the role of Regional Centres;
- To revisit the role of Learner Support Centres; and
- To recast the existing role of academic counsellors.

COMMUNICATION TECHNOLOGIES FOR ONLINE TUTORING AND COUNSELLING

The communication on the Internet takes place in two ways - Synchronously and Asynchronously. The communication that happens in real-time and the sender and the receiver of the communication is connected in real-time are part of the synchronous communication. The communication that does not necessitate the connectivity of the sender and the receiver at the same time, and provides an opportunity to receive the communication and respond to it with a time gap; form part of the asynchronous communication. The online technologies used for pedagogical purposes by the open and distance learning institutions also can be classified in the same manner. These technologies follow collaborative learning principles (Hung & Nichani, 2001).

In the asynchronous environment of communication, the teaching and learning process takes place in real-time between the teacher and the learners while they are separated by space (Pulist, 2002). The real-time interaction with the teacher serves as a motivating factor for the learners. Some of the web tools facilitating online two-way communication synchronously are listed below: **Chat Applications** which provide the facility of exchanging audio, video, images, and graphics in addition to text messages which can be used for live interaction synchronously (WhatsApp, Yahoo Messenger FaceBook Messenger, WeChat, Telegram, etc.); and **Web-conferencing tools** which provide access to two-way communication through Voice over Internet Protocol (VoIP) (CISCO Webex, BlueJeans, Google Meet, Microsoft Team, Skype, WhatsApp Audio and Video conferencing, etc.).

The asynchronous technologies facilitate the communication between the teacher and the learners remotely, not necessarily there being connected in real-time. The teaching and learning in this environment do not take place simultaneously. This format communication decreases the dependence of the sender and receiver to be available simultaneously. The receiver of the message can give a response to his/her convenience. Some of the applications used in the asynchronous environment are mentioned below:

An email which is a common method of communication today; **Online repositories** for storage of video content (TeacherTube, Vimeo, YouTube, etc**),** and storage of textual material (e-Gyankosh, SAKSHAT, etc); **Mailing Lists and Discussion Boards** can be used for communication from one to many; **Social Networking Applications** are being explored for educational purposes given their popular usage (Facebook, Twitter, Instagram, Pinterest, etc.); **Online Classrooms** online learning platforms have come up in the virtual environment that offer tools for communication, collaboration, counselling and tutoring at a distance. The teacher can create a personalised pace for the learners while tracking their progress in the learning process. These platforms enable the teachers to conduct quizzes & online polls, assign & receive assignments, share content and communicate with learners in an effective manner (Google Classroom, Easy Class, WizIQ, VEDAMO, LearnCube, Edmodo, etc).

The salient features of the synchronous and asynchronous communication technologies suitable for tutoring and counselling distance learners are presented in **Table-1.**

Table-1: Salient features of the synchronous and asynchronous communication technologies for online tutoring and counselling

Name of Technology	Synchronous/ Asynchronous	Type of interaction	No of Participants	Suitability for the type of activities
WhatsApp Chat	Synchronous	Real-time interaction	The formation of groups and channels on these Chat applications provide the option to reach many students at the same time without much effort. This application also provides the facility for conducting video conferencing while managing the chat room activities. The sharing of the documents and presentations is possible with them.	The academic counsellors can make use of these chat applications for providing academic guidance to the learners. This application is most suited for counselling, tutoring and online lecturing. The learners can also be allowed to present their cases online before other learners.
Facebook Messenger	Synchronous	Real-time interaction	The formation of groups and channels on these Chat applications provide the option to reach many students at the same time without much effort.	The academic counsellors can make use of these chat applications for providing academic guidance to the learners.
WeChat	Synchronous	Real-time interaction	The formation of groups and channels on these Chat applications provide the option to reach many students at the same time without much effort.	The academic counsellors can make use of these chat applications for providing academic guidance to the learners.
Telegram	Synchronous	Real-time interaction	The formation of groups and channels on these Chat applications provide the option to reach many students at the same time without much effort.	The academic counsellors can make use of these chat applications for providing academic guidance to the learners.

CISCO Webex	Synchronous	Real-time interaction	This application provides the facility for conducting video conferencing while managing the chat room activities. The sharing of the documents and presentations is possible with them.	This application is most suited or counselling, tutoring and online lecturing. The learners can also be allowed to present their cases online before other learners.
BlueJeans,	Synchronous	Real-time interaction	This application provides the facility for conducting video conferencing while managing the chat room activities. The sharing of the documents and presentations is possible with them.	This application is most suited or counselling, tutoring and online lecturing. The learners can also be allowed to present their cases online before other learners.
Google Meet	Synchronous	Real-time interaction	This application provides the facility for conducting video conferencing while managing the chat room activities. The sharing of the documents and presentations is possible with them.	This application is most suited or counselling, tutoring and online lecturing. The learners can also be allowed to present their cases online before other learners.
Microsoft Team	Synchronous	Real-time interaction	This application provides the facility for conducting video conferencing while managing the chat room activities. The sharing of the documents and presentations is possible with them.	This application is most suited or counselling, tutoring and online lecturing. The learners can also be allowed to present their cases online before other learners.
Skype	Synchronous	Real-time interaction	This application provides the facility for conducting video conferencing while managing the chat room activities. The sharing of the documents and presentations is possible with them.	This application is most suited or counselling, tutoring and online lecturing. The learners can also be allowed to present their cases online before other learners.

Email (Gmail, Yahoo, Hotmail, Rediffmail, etc)	Asynchronous	Live interactive communication as well as communication at the convenience	To many receivers at the same time following one to many communication systems.	The audio, video, graphics and text files can be sent through email as an attachment to the sender. The collaborative peer/ group learning is possible through this system. The email system can be used by the academic counsellors for tutoring and counselling of the learners. The audio and video lectures along with graphics can be sent to the learners for better understanding of the concepts. The learners can submit their home assignments through email which can be assessed by the academic counsellors for providing constructive feedback to the learners.
TeacherTube	Asynchronous	Online repository dedicated to educational video content.	Educational organisations and teachers can share their educational content such as audio, video, slides etc. with the educational community.	The academic counsellors can share their academic content meant for counselling purposes through this website with their learners. The repository hosts a mix of teaching and learning resources developed by the experts in their respective areas
YouTube	Asynchronous	Online repository dedicated to educational video content.	Educational organisations and teachers can share their educational content such as audio, video, slides etc. with the educational community.	The academic counsellors can share their academic content meant for counselling purposes through this website with their learners. The repository hosts a mix of teaching and learning resources developed by the experts in their respective areas

Vimeo	Asynchronous	Online repository dedicated to educational video content.	Educational organisations and teachers can share their educational content such as audio, video, slides etc. with the educational community.	The academic counsellors can share their academic content meant for counselling purposes through this website with their learners. The repository hosts a mix of teaching and learning resources developed by the experts in their respective areas.
Social Networking application (Facebook, Twitter, Instagram, Pinterest, etc)	Asynchronous	Live interactive communication as well as communication at the convenience.	These can be used for organising or sharing sessions as well as live interactive sessions with a large number of users.	These sites allow the users to share content, opinion, audio, video and graphic presentation with the rest of the world. These applications are being used for pedagogical purposes by the education institutions especially the ODL institutions. In addition to sharing useful content over these websites, The ODL institutions can well make use of their educational potential for arranging counselling sessions with learners at large
Online Classrooms (Google Classroom, Easy Class, WizIQ, VEDAMO, LearnCube, Edmodo, etc.,)	Asynchronous	Online learning platforms with a virtual environment that offer tools for communication, collaboration, counselling and tutoring at a distance.	The teacher can create a personalized pace for the learners while tracking their progress in the learning process.	These platforms enable the teachers to conduct quizzes & online polls, assign & receive assignments, share content and effectively communicate with learners. Many of them provide evaluation tools in the form of rubrics that can be used by the teachers for evaluating the performance of the learners and awarding their grades. The ODL institutions can make use of these platforms for reaching their learners with content, tutoring, evaluation and scaffolding services in an integrated manner.

Appropriateness of Technology

The modern communication technologies have made the teaching and learning process easier, cost-effective and faster. The article suggests different applications for various pedagogical purposes especially the tutoring and counselling which are representative only. Several other applications are available to the users at different costs and tariffs. While some of the applications are available freely for personal use, institutional/enterprise versions can be acquired by the institutions at a cost. The ODL institutions may identify and make use of the applications keeping in view their requirements, resources and expertise. However, a version control mechanism over different versions of technologies to be used for academic activities needs to be put in place as a policy keeping in view the fact that users with different versions of technologies would be accessing the institutional servers and consequently, may face compatibility issues. Use of advanced versions of technology by the institutions may restrict the access of the virtual environment to the learners who might still be using older versions of applications. In addition to this, management and upkeep of data centres housing prominent student data would be a crucial area seeking the attention of the institutions. A robust data security system would go a long way in preserving the sanctity of the data in the cyberspace and providing seamless linkage and access to the institutional resources.

METHODS OF ONLINE TUTORING AND COUNSELLING: AN OPERATIONAL MODEL

Each programme offered through ODL mode consists of many courses, depending upon the duration and level of the programme. All programmes have the component of academic counselling and tutoring. For programmes in Sciences, Computer Sciences, Library Sciences, Health Sciences, etc., there are practical components which are to be transacted through laboratories/ hands-on training/ skill development centres, etc. All ODL programmes follow a learning outcome-based curriculum framework (LOCF). Accordingly, programme specific outcomes (PSO) and course-specific outcomes (CSO) are spelt out and the evaluation methodology is pre-decided as per the LOCF. To minimise the transactional distance and overcome the isolation of distance learners, and keep them motivated, on-track, regular academic counselling and guidance are provided throughout the study. Also to enrich their learning experience, avenues are created for interaction with peers and subject experts. Learners are also provided regular updates; tested through tools of assessment and provided feedback on performance. The learners are also facilitated for reference work at library and field activities for acquisition of necessary skills and competencies. Table-2 provides the details of different academic components of an ODL programme and suggestive technologies which can be used to accomplish these activities.

Table 2: Suggestive Technologies for various Components of Counselling and Tutoring:

Sr No.	Programme Components	Description of Activities	Suggestive Technologies
1.	**Self-Learning Material**	All courses that constitute a Programme	Blocks/ Modules (Print), TeacherTube, YouTube, OERs (web-based), MOOCs (SWAYAM), Online courses (LMS), Digital repositories
2.	**Informing and Updating**	Updates of different activities or deadlines during studies	SMS alerts, ChatBot, YouTube, WhatsApp, Twitter, Facebook, Announcements on Website, Email, etc.

Sr No.	Programme Components	Description of Activities	Suggestive Technologies
3.	**Advising and Counselling**	Providing advice and person-specific counselling to overcome hurdles during the study.	FAQs on Website, Email, SMS, WhatsApp, Facebook Live, Google Meet, Skype, BlueJeans, Microsoft Team, Facebook- Messenger, WhatsApp Chat, Telegram, WizIQ, etc
4.	**Continuous assessment**	For evaluating learner outcomes during the course and providing feedback on performance (Tutor Marked Assignments (TMA) (Essay type questions, Short answer questions, and multiple-choice questions), Computer Marked Assignments (CMA) multiple-choice questions), Online tests (Multiple choice questions)	Pdf attachment through email, Online quizzes, Google Drive, OneDrive, Google Forms,
5.	**Academic Counselling (Subject-specific)**	Providing subject/course-specific academic guidance and counselling: Theory Courses (10% of the total study hours) Practical Courses (100% of the total study hours)	Theory Courses: Google Meet, Skype, BlueJeans, Microsoft Team, Facebook WhatsApp Chat, WhatsApp Telegram, Facebook Live, etc. Practical Courses: Virtual labs, Online Simulation Programmes, Virtual Reality, Virtual Tours, Second Life, Augmented Reality Programmes, etc.
6.	**Guidance**	Guiding for preparing Project/Dissertations(Project work/ Dissertation/ Project Report)	WhatsApp, Email, Google Meet, Webex, BlueJeans, Skype, Google Classroom, Edmodo

The academic counsellor is responsible for providing academic counselling and tutoring support to distance learners at LSC for the conduct of different activities mentioned in Table 2. Currently, these activities are mostly performed in a face to face situation on weekends/ holidays as per the counselling schedules prepared by LSCs. However, the focus of this paper is a paradigm shift from face to face counselling and tutoring to online methods of tutoring and counselling. This paper provides a framework to enable the Academic Counsellor to plan these activities through the selection of appropriate available technologies suggested in Table 1. Academic counsellors may choose various types of media – text, image, audio, video to communicate with learners through various available online tools. It can be synchronous communication or asynchronous communication. The template given in Table-3 will facilitate the academic counsellor to systematically plan the delivery of a course allotted to her/him. This will also serve as a checklist for them to ensure that the LOCF of the particular course is

not overlooked and the learning resources to be utilized including the tutoring and counselling tools and activities that would ensure the acquisition of required skills and competencies by the learners.

Table 3: Plan for online counselling and tutoring

Name of the Programme:_____					
Name of the Course	**Learning Outcomes**	**Learning Resource(s)**	**Tutoring and Counselling Tool(s)**	**Assessment Tool(s)**	**Suggestive Activities (to be guided by Academic counsellor)**

RE-CONTEXTUALIZED ROLE OF REGIONAL CENTRES

The RCs serving as the sub-offices of the OU/ DDE in the region would be re-contextualized to the changed scenario. The number of RCs could also be scaled down depending on the logistics and requirement of the ODL institution to coordinate with the LSCs/DLHs in the region.

a) Conversion of LSCs to Digital Learning Hubs (DLHs)

The first step would be to convert the existing LSCs into Digital Learning Hubs (DLHs) (Srivastava & Suman, 2018). The LSCs having computer labs can be easily converted into DLHs where the academic counsellors and learners can access computers with internet connections for participating in the proposed online tutoring and counselling services. This is necessary to facilitate the learners and academic counsellors, who may not have access to digital media or internet connectivity. The learners can access other online educational resources at these locations.

b) Establishment of Data Centre for Database Management

The proposed paradigm shift will exponentially enhance the traffic to the central servers. It will also lead to the generation of huge databases with live access to the stakeholders. Given this, there is a need for the creation of a Data Centre at all RCs for management of data of various academic activities that has to be kept secure and protected with uninterrupted power supply and proper backup facilities.

c) Distribution of learners and allotment to DLHs

The enrollment data of the learners available at the regional level would be used for data mining and distribution of learners and allotment to various DLHs. RCs will beforehand obtain information from the learners and academic counsellors regarding the availability of devices with internet connectivity, to do a reality check before commencing the activities.

d) Training of DLH staff and Academic Counsellors

The RC should conduct orientation programmes for the academic counsellors and learners to familiarize them with the new technologies and demonstrate how to use them effectively in the teaching-learning process.

e) Online Helpdesk

The database management needs to be put in place due to the creation of the Data Centre, coupled with the adoption of Interactive Voice Response (IVR) that allows a computer to respond by taking the inputs, processing it and giving the output through the use of voice. This will enable RCs to introduce a fully automated Online Helpdesk for attending to learners and responding to them accurately and timely. Introduction of institutional ChatBots can play a substantial role in this process. Both academic and administrative support can be provided through this approach. Academic queries could be forwarded to the concerned academic counsellors on email, to respond to the learners via email.

f) Cell for Student Tracking

All registered learners should be tracked and fed with regular updates by a dedicated Cell set up for this purpose. Learning analytics will strengthen the decision-making process in the interest of providing seamless tracking of the learners. Such measures will motivate the learners and also reduce dropouts as the purpose would be to track the progress made by the distance learners and identify those learners who are unable to navigate through the learning path charted for them and are lagging and require additional support in terms of tutoring and counselling. Accordingly, changes could be made and special initiatives were undertaken to benefit the latter.

g) Cell for Learning Analytics

RCs would be required to set up a separate Cell for Learning Analytics whose primary task would proactively facilitate the learners by identifying the diverse learner groups by adopting a segmented approach, namely: old age learners, homemakers, PwDs, defence and security personnel, economically weaker learners, learners residing in remote areas/ difficult terrains/ backward areas/ rural areas, among others. Also, analysis of data at all stages of the student lifecycle will provide insights about how they learn, what their preferences are, and predict the correlations in their contexts. Both the Cells for Student Tracking and Learner Analytics could work in tandem to assist the ODL institution in making informed decisions in providing the much needed special support required by the at-risk learners and helping them continue to be mainstream learners.

REDEFINING THE ROLE AND FUNCTIONS OF LEARNER SUPPORT CENTRES

The role of the existing LSCs would also change in the proposed scenario. Learner support services are paramount in the ODL system whether it is distance learning or online learning. The chances of a distance learner to complete his/her programme of study successfully, primarily depends on the effectiveness of the support services offered by the ODL institution at its LSCs. The changes required at the level of the LSC are as follows:

a) Converting LSC into Digital Learning Hub (DLH*)*

Presently, the requirements of LSC includes infrastructure like lecture theatres/ classrooms, office space, library etc. But after opting for online counselling, there will be a requirement of well-equipped computer labs with latest computer machines and a provision of internet connectivity e.g. Wi-Fi, broadband, etc. The design of the DLH should be a space that promotes informal learning where the learners can come and study online using computers with internet connections (Srivastava & Suman, 2018). The academic counsellors should also have access to these computers in case they do not have the required facilities at their homes. Harrad & Banks (2016) opined that the counsellors should design online counselling sessions to be time-sensitive in such a way to promote richness and depth in conversations. Ensuring a positive and rewarding experience of online counselling, the DLH must provide equitable support infrastructures that are also appropriately translated into the online environment (Pullan, 2011).

b) Assistance to Utilize Technology:

In India, where the population of digital illiterates and digital immigrants is higher than the population of digital natives, it is important to provide human support and training to distance learners to handle the technology. The

most vital support to the learners is freely available online-friendly academic resources and sufficient opportunities for interaction with the academic counsellors (student-instructor interaction) (Cannady, 2015).

c) Orientation of Distance Learners

Although the assistance to distance learners can be provided at LSC yet it is important to orient learners on how to access the technology and avail the facility of online counselling. It is also mentioned by Cho (2012) that providing orientation services, to the learners, is essential to integrate the current environment into their new online learning environment. It is proven that orientation programmes have improved student retention and academic performance.

d) Identification and Training of Academic Counsellors

It is one of the important roles of DLHs to identify the academic counsellors as per the eligibility criteria mentioned in UGC (ODL) Regulations, 2017 (GOI, 2017). Academic counsellors should be trained by the RC academic staff/faculty at the Headquarters in the usage of the web-based technologies and familiarized with online pedagogical requirements of online tutoring and counselling. Roddy, *et al* (2017) also pointed out that learners adopting study *via* intensive modes (online counselling) have increased expectations of their instructors (academic counsellors). Therefore, to meet the expectations of distance learners availability of well trained academic counsellors is necessary.

e) Availability of e-Library

The proposed DLH is expected to act as educational resource centres also. Therefore, every DLH must have the facility of an e-library for the learners. To ensure maximum utilization of library services, DLH should subscribe to online library services, e-resources like e-books, e-journals etc. and provide remote access to its learners. Development of a mechanism to share the subscription of education digital resources available with the central library of the ODL institutions can also be thought of sharing with the DLHs.

CONCLUSION

The ODL system has the potential to fill in the knowledge and skill gaps in bulk, to serve the needs and aspirations of millions of learners. The Indian Government also realizes the importance of online education therefore the regulations particularly for the online programme was notified in the current year only to maintain the quality in higher education through online mode. Due to pandemic digital learning is trending nowadays, yet it can be considered as the future of teaching and learning. Keeping this vision in mind, the National Education Policy (GOI, 2020) of India also focused on online education. It suggests that leading educational institutions will conduct pilot studies on various areas of online education like student device addiction, most preferred formats of e-content, etc.

Efforts are also required to overhaul the system with the adoption of the latest technologies that can be more effective than traditional classroom-based instruction which is still regarded as more superior to ODL methods of teaching-learning. Digital technologies are disrupting the entire Higher Education system and there is an urgent need to recast the system in the interest of the present and future generations who are tuned to process information differently using digital media. Uninterrupted power supply and availability of internet connectivity is a must for effective implementation of Online Education and making these available is a major challenge for Online Education. Although Internet access to the remote area is gradually increasing and quality of Internet speed is also improving, that is not enough, Online Education requires more rigours speed, security, and availability of the equipment and tools to realise the Internet-driven virtual classrooms. Restructuring educational institutions, re-skilling faculty in online teaching and familiarizing the learners to virtual learning is a big task ahead. To address the need for basic infrastructure which is required for online education the NEP, 2020 make the provision of budget to develop the infrastructure and resources for extensive use of technology.

Further, for making the online counselling and tutoring more successful the readiness of HEIs of shifting from traditional methods to contemporary methods of teaching and learning is of utmost importance. L Price *et al* (2007) also suggested that there is a dire need of training opportunities for educators and learners for effective online communication and there is a requirement to understand the nature of online tuition and prerequisites for effective online interaction.

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THE NEW AGE DISTANCE EDUCATION LEARNERS – EMERGING TRENDS

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ABSTRACT
In a Higher Education Institution, Student Affairs department plays an integral role for the smooth functioning of the institute. A student when in need of any information or for any of his queries or for grievance redressal, first approaches this Student Support Service department. The efficiency and the effectiveness of this unit in addressing the student's queries and their requirements, facilitate in harnessing the student's effort towards the core academic activity. The paper attempts to unravel the different needs of the students at different stages of the student life cycle, the student services which are to be made available by the higher education institution at those appropriate times, the relevant information which are to be shared with the students prior and assess its impact on their learning progress. This study was conducted in a higher education institution which offered distance education program. A distance education student for any of their requirements first approaches the student service department only then if needed he connects with his academic department. It is seen that an immediate query redressal by the department facilitates in enhancing the learner experience. And this greater level of engagement has resulted in an improved student retention.

INTRODUCTION

Academics, Examination, Administration and Student Affairs form the four pillars in any Higher Education Institution–University setup. For Universities offering 'Open and Distance' Education mode, the Student Affairs department form the backbone of the entire system. It is the first and the foremost department to which the student connects to get the queries addressed. A student's first interaction with the University is through this department. Only then a student steps into his core department. Especially in distance education mode, throughout the student life-cycle, the student support service department facilitates them in their academic pursuit. This department shares the University updates related to counselling session, record submission, and exam registration and also at time nudging them to complete their academic record submissions before appearing for the Term End Exams.

In Indian Higher Education space there are two predominant modes for formal education that are Campus mode and Open and Distance Education Learning (ODL). In the recent past Indian Government has formulated policies for the third alternate mode, namely the Online Education. Once the Institutions/ Universities are identified, approvals get extended to them, thereon this third mode of education come into existence. In the very recent past, UGC has Institutions for offering Online Education in India. The Open and Distance Education mode (ODL) is a model wherein the learning takes place using a wide range of student–teacher engagement tools both through offline and online. In this model, the Student–Teacher are separated both by space and time, and they get connected through a limited Face-to-Face interactions and in online through Audio-Video conferencing and an LMS.

This mode of education is chosen by learners who are already employed and want to enhance their education credentials or by those who could not attend full-time classes in campus education because of some personal reasons and prior engagements.

India's Higher Education, Gross Enrolment Ratio (GER) as per All India Survey on Higher Education (AISHE) 2018-19 is at 26.3%. Target set for 2020-21 is 30%. As per the same report, distance education mode makes up 10.62% of the current GER. The total distance education enrollment is at 3.97 million, of which 44.15% are female.

In the earlier ODL framework, the academic delivery modelled was in line with the Campus education. The student and the teacher had to connect at one common place for the stipulated duration. During this period the student gets all their academic doubts clarified by the teacher. The only difference had been the duration of the teacher—student contact. For a one credit course in campus education, the teacher—student contact is for a minimum of 15 hours,

whereas in the distance mode it is 3 hrs. Besides these contact hours, a student is advised to spend additional time on reading and learning the 'Self Learning' printed study material, the supplementary online study material and also on the preparation and writing the Assignments.

In 2017, the Indian Higher Education regulator, the University Grants Commission (UGC) came out with new and revised distance education policy framework, the Open and Distance Education 2017 (ODL 2017) regulations. It recognizes a blended academic delivery framework. As per this new policy, counselling sessions, teacher–student contact is now possible using an Online Learning Management System. The policy permits the use of webinar, discussion boards, and live chat tools for academic delivery.

This change in the Indian distance education policy is seen as an outcome of the Indian Internet revolution, its penetration, improved speed and its adoption rate. As per the latest Kantar IMRB's report, the Internet Users in India stand at 560million in 2018 and projected to increase by 11% to 627 million in 2019 as against 240 million in 2014. In the same period, the monthly Internet data consumption has increased from 86MB to 8320MB. The number of smartphone users had increased from 5.4 to 26.2 per 100 people. The Mobile Internet and Fixed broadband speed recorded in June 2019 stands at 10.87Mb and 29.06MB respectively as against the average internet speed of 1.7Mbps in 2014.

In today's technology advancement and its adoption, this paper discusses the importance of the student support service and the role played by it in facilitating the new age learners in their academic journey in distance education mode. The paper highlights the student preferred communication medium to connect with the Student Support Service, the issues for which they connect the most. The paper also discusses the impact of this function has on the Student's academic progress.

The study carried in this paper is solely uses the student connect details at the support service helpdesk number. The entire call history including the student information detail which includes their personal profile–age & gender, academic participation and the academic progress were gathered. These details are then analyzed in formulating a student intervention framework to further enhance their learning experience. To collaborate the findings of this study there was no exploratory research done. The students were not subjected with any questionnaire to get their feedback on the student support service operation, their specific needs and intervals at which they would need any kind of support for learning. Such a survey would help in reiterating the experimental findings that have been discussed in this paper. The study highlighted in this paper has helped in improving the student retention and their success rates.

Research focused on distance education institution which had its own campus offering regular education–dual mode Institution. This study does not validate with a pure distance education institution.

The study did not focus on the faculty support extended to a student in his learning progression. The study focused only on the student's queries or complaints landing at the helpdesk, nature of the query, the resolution provided to it by the helpdesk and their impact on the students' progress. The study did not test the quality of resolutions provided by the helpdesk and the turnaround time taken in addressing the student query especially for student queries received through Email.

This paper is structured as follows: Section II provides an insight on the related work carried out in Student Support Service and its impact in the Higher Education space especially in distance mode, Section III details the profile of the students used for this study, Section IV highlights the communication medium preference of the students in interacting with the University's Student Support Team and its impact on the student's academic progress, Section V addresses the future scope of this study and Section VI concludes the paper.

RELATED WORK

Studied the role of Student Support Service and its impact in the learning experience in a University setup offering different modes of education be it Campus, Distance or Online.

Alan Tait (2014), in his paper argues how the Student Support has to be an integral part of the curriculum design, the learning and teaching system in the distance education mode. The paper discusses the benefits of this integration and the ways the advances in the ICT space mainly in the Internet and the Internet enabled application are to be used in

improving the learner experiences. The author has also envisaged a role of an online academic mentoring as part of the student support service. This is to be in additional to then the optional face-to-face meeting which exists. The paper discusses that drop-out of student from studies is merely not on the mode of education–full-time or distance but with the lives of the students dependent on social, cultural and financial status of a student.

The 2014 THE World University Rankings of Sep. 2014 report discusses the importance of an early positive response for an Undergraduate student to reduce the dropout rates. The report states that a University has to make special efforts to ensure that a newly joined student receives an instant and supportive details when in need. And how the student support can play an active role in this initiative.

Tom Inkelaar & Ormond Simpson (2015), in their paper, shows that how a motivational Email can help to improve the student retention in the program. Author at the same time argues that retention of a student in distance education always depends more on the personal human support and less on the technology enabled learning tools. The paper compares the online MOOC courses and distance education to show the similarities in these two modes of program delivery and how the student drop-out rate is almost similar in both forms of program delivery. In this background author uses an inexpensive tool, namely the Email, to send inspirational quotes to motivate the students to continue with their program and found a higher success rate as against not using this method for a group of students. The subject of these motivational emails ranged from tips to self-organize to find time for studies, how to manage procrastination, improve concentration on learning, to how to prepare for exams.

Manzoor Babu (2012), in his paper shows why is it important to strengthen the support system which plays a role right from the pre-enrolment guidance, induction to the time of the graduation. He argues that if sufficient steps not taken in this direction, then one could see a deterioration in the standard of education. The author had conduct his study across three Indian Universities which are not dual mode University–a University which offers program both through campus and distance rather are pure distance mode Universities. The paper discusses how the student study centers were unequipped to give proper direction to the queries which they had.

William W. Arnold (2018), highlights the use of student support counsellors to defuse the compartmental nature of different support departments of a University system. The author shows how a program design with interweaving of student support services can produce a relevant and timely student transition to pursue a career. The paper discusses the need to prioritize and implement policies, program delivery and student support services to deliver a higher success rate. The paper highlights how institutions are transitioning to adopt the newer and efficient technologies which support in a better operation and communications. These newer technologies enable to produce tons of data, be it on different interactions and communication of the students with the institution. These data on analysis will help in getting newer insights into a student needs and the effectiveness of the program.

Akwasi Arko-Achemfuor (2017), in his paper, discusses how and why the students are unwilling or factors restraining them from using the support services the institution offers. A questionnaire was used to get the student feedbacks along with the problem nature which they faced in utilizing the support services. They were also asked to rate the student services offered in terms of their importance for them and did they access it in the recent past. The survey outcome showed personal counselling as their most preferred requirement, followed by it was the need for a single point of contact to get their concerns addressed. For this, the author in this paper suggests how an online technology tool can monitor and test the student experiences of the support system offered by the University continuously. Such system should get the factors supporting and hindering the learner's learning outcomes, the factors which help in improving the learner engagements, and in their overall satisfaction. These outcomes could then evaluate the programs offered, and the staff associated with it at periodic intervals, and bring in a continuous improvement of the system.

Saba Mirja & Shireesh Pal Singh (2014), in their paper argue on how the efficiency of the Student Support Service largely decides the effectiveness of the instructions in the distance mode of education. Author studied the student support service of one of the India's largest distance education University based on the gender and demographical effectiveness. The study showed how students with a strong ICT background could use the student support services of the University better, and also how an online student support service facilitates to reach a large section of student population. The results also brought the need for a good coordination among different University departments for a successful implementation of the Student Support System.

Sahin, I., & Shelley (2008), in their paper show how the availability of four motivating factors–the computer knowledge, flexibility of distance education, usefulness of distance education, and distance education satisfaction will lead to higher levels of student engagement, learning and success in distance education. The results of the study conducted in this paper show the importance of Student's ICT awareness and their attitude factor in predicting the student satisfaction. The more the student believes in the usefulness of distance education, the more likely they will enjoy attending the distance education classes. Once a student perceives satisfaction from the distance education learning, the online mode of communication through email, use of the discussion boards and the online submission of assignments, would lead to a higher level of engagement, learning and success.

Cletus Kolog Ngaaso & Anthony Abbam (2016), in their paper show how the readiness of the helpdesk staff and instructor demonstration of knowledge in the subject area are influencing the level of satisfaction of a student in distance education mode of program delivery. The paper recommends that Universities offering distance education should make all efforts to do an in-depth study of learner support service even with the peculiar learner's requirement and expectations. Such a study will help in improving the student experience. Also, there should be a continuous assessment of the quality metrics as against the peculiar distance learners need and satisfaction.

B K Somayajulu, and Tata Ramakrishna (2008), through their survey have found that getting admissions in distance mode is very easy process. However, students do not have sufficient and correct information on their queries. Most of the learners do not have clarity on processes and the support service available through which they can get their queries addressed. Interestingly, most of the learners would like to have ICT-based support service system. The paper also suggests that personnel working in student support service team should be with requisite qualification with good coordination skills, clear with the role and responsibility, provided with adequate training to perform the role with commitment. The paper also suggests that timely feedback would increase the retention and completion ratio.

Madeleine Bornschlegla and D. Cashmanb (2019), had used the Joseph pine and Gilmore (1998), experience economy model to understand the correlation between the satisfaction and the intention of a student to pursue the program esp. in distance education. This study is an attempt to find solutions to an existing problem of lower success rate of students in distance education. The results show that program factors and distance education experience should be considered while designing a program.

Rendani Sipho Netanda, Joel Mamabolo and Mahlapahlapana Themane (2017), carried out a survey to identify the significance of the student support function in distance education to reduce the student's attrition, increase retention and to create a competitive advantage. Results pointed out that students rated student support only next to financial support, as the most important factor in continuing with the education. The support intervention provided during their course of study motivated them to continue and complete the program successfully. Students with age over 35 years showed greater requirement of technical support in using the online technologies to have greater academic experience. New students enrolling to the distance education program rated academic support as their top priority need. Author in the paper suggests that it should provide students with periodic feedbacks by their academic instructor, as increasing their interventions be it through face-to-face meeting or call or email has a greater impact in retaining the student in the program.

Harry Barton Essel, Akosua Tachie-Menson, Michael Owusu (2018), in their paper reinforce the need of student support service in distance education mode of delivery. A timely delivery of academic calendar, study materials, face-to-face meetings, and online support facilitates a greater convenience and flexibility for students in smooth progression to complete their program successfully. Deprived of this support esp. in distance mode will discourage and frustrate a student in completing the program with ease.

Madeleine Bornschlegl, David Cashman (2018), in their paper used the experience economy model of the Joseph pine and Gilmore (1998), to study the relationship between Student Experience and Satisfaction in their retention in online program and their likelihood of completing the program successfully. The results show that a student's intention to continue the program and the student's satisfaction are indirectly related. To address this author proposes to create opportunities for students to interact with faculty at a regular basis.

Nhlanhla Mpofu (2016), in his paper, suggests that the lack of academic support in distance education leads to higher attrition. In this context, the author studied the self-efficacy of teachers who had enrolled for the distance

education program. In his study the author states that till date there had been a sufficient focus on the institution role in how the student support service is provided. There has been no effort towards taking into account the self-efficacy of a student who is pursuing the distance education.

Richard Ouma (2019), in his paper elaborates the research carried out by him to address the challenges by a distance education institution in managing and running a student support service primarily for in-service teachers who had enrolled for a distance education program. The research outcome had been that the students lacked reading culture and because of this they lacked in reading the study material issued them as part of the program enrollment, and the other main factor hindering their course progress was the organization of unscheduled and unplanned counselling sessions conducted by untrained counsellors. The author in his paper emphasis that there needs to be well trained people who are manning the student support function.

Bundit Busaba , Suchai Tanawastien , Prinya Tantaswadi, (2019) in their paper suggested an information system which is managed centrally to address the student dropout concerns and improve the retention rate. The system proposed must be able to identify the student who has the concerns and schedule advisory and counselling support to address them. The student parameters which need to be captured to identify such students is to include the students learning outcomes and behaviours, their attendance and academic grades, fees payments details and their club participation details and also the student's social media activities. This system of student monitoring had a positive influence in student retention and in student graduation rate.

Zuhairi, A., Karthikeyan, N. and Priyadarshana, S.T. (2019) in their paper revealed the design, development and implementation of a student support service in two different Open and distance education Universities. ICT was used to address the student needs with a zero defect objective right from admissions to monitoring the progress of the student learning. It emphasised on students to get the right support by the right individual concerned.

Tatiana Markova, Irina Glazkova and Elena Zaborova, (2017) in their paper tested the student's interaction and collaboration in the academic delivery process, assessment and student support services. ICT solution along with faculty teaching practices and communications with students will strongly influence in providing a greater learning experience for the students. The survey rated the importance of both support services and technical services offered by an Institution in student lifecycle to improve their academic participation and to complete the program.

Asteria Nsaba, Mpine Makoe, (2017) in their paper emphasis on the importance of the student support service offered by an institution offering distance education. Study of the existing services will provide an insight on the student perceptions of this service and their expectations. The six parameters suggested by the authors to assess the quality of student support include, reliability of the service, its tangible outcomes, delivery, responsiveness and assurance provided by the student support services and the student participation. The study shows that students not only concerned with the outcome of the service but also how the service is.

Srivastava, M., Mishra, B., Rao, D.K., Abrol, N., Varma, V. and Bhushan, B. (2020) in their paper highlights the research trends in the Indian Open and Distance Education (ODE) space. The last 10 yrs. of publications showed that learner support and progression theme was next to the themes on teaching, learning and evaluation and curriculum design.

Sánchez-Elvira Paniagua, A and Simpson, O. (2018), in their paper discusses the European Association of Distance Teaching Universities (EADTU) initiative which centred on the student support to empower students to lifelong, self-directed learning in the online and blended learning education space. The objective was to increase the student retention and enhance academic performance and satisfaction. It emphasised the need of quality metric of student support both at institution-level and at course-level.

Methodology

The student interaction with the University's centralized Student Support Service team were collected and analyzed for this study. This centralized facility was setup to cater only for the students who had enrolled for their distance education program. University under consideration for this study offered both undergraduate and graduate programs in Management and Information Technology streams. Students who reached the support service team were for different reasons which included Pre and Post Admission Counselling, Registration to next higher semester, details on print study materials, Access and Availability of Online Learning Resources, Faculty support, Examinations,

Degree Certificate dispatch, Degree Verification by the prospective Employer, Issue of Letters for the different purposes. This dataset which was considered for study included both the call and email interactions that took place between the student and the student support service over a semester duration of six months.

In this period 24730 students had availed the services of the student support of this University. A further analysis of this dataset revealed that students who had enrolled even up to 8 years back also had come back to the University and availed the services of the University. These students include those who have either completed their degree program and those who have are yet to complete a few of their courses for the award of their degree. This cohort of students formed 55% of the total student population who had availed the services of the University's Student Support in the above mentioned semester duration. The remaining 45% were the students who have enrolled in the current semester and pursue the study for successful completion of their degree program.

The demography of these students included students pursuing both undergraduate and graduate program. Of the total population, 25% were students of the undergraduate program and the other 75% were graduate program students, with the mean age of 26 years, and that of undergraduate and graduate were 24.13 and 26.75 respectively.

The gender ratio of the student population was found to be skewed with more male students than the female students with 75% of them being male. The female gender ratio was found to be much lower than the 44.12% as reported in the All India Survey on Higher Education (AISHE) 2018-19 report. The same report states that share of male students is higher than female except in graduate and certificate course. The experimental dataset, when segregate the into undergraduate and graduate program students, found to be in alignment with the AISHE 2018 -19 report regarding the female student percentage pursuing their higher education. In undergraduate program it is same as that of the dataset population ratio is at 26%, whereas for graduate program it is at 36%.

The mean age of female with that of male student shows that female gender chooses distance education as the mode for their higher education at a much younger age when compared to male students. This behavioral pattern of females could attribute to the socio-economic reasons wherein the females prefer to continue with their higher education post the schooling without a break. However, the male students wish to take a break on completion of schooling or after graduate program, join the workforce for a few years and then pursue their higher education. The age and gender distribution of the dataset is as shown in the Figure 1.

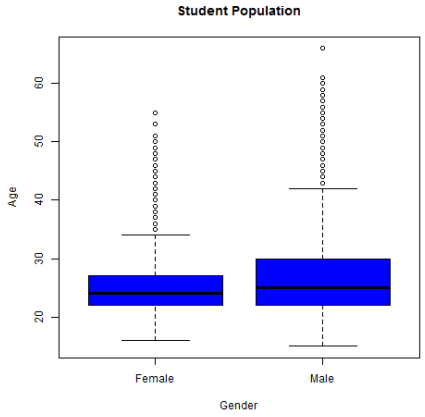

Figure 1: Dataset – Age and Gender distribution

RESULTS

Student Support Services availed by the students in the six of semester duration were predominantly through two communication channels, namely Telephone Call and Emails, were analyzed. The alternate communication channel supported by the University were through Social Media and Online Chat. A less than 2% of the student population used these alternate channels. These students were the ones who could not connect with the University's Student Support Service through telephone call during the working hours but wanted to avail the University's services during off-hours, seeking attention to their queries.

Students preferred calling at the University Helpdesk over emailing their concerns and waiting for support. Of the total touch points which happened between the student and the University's Student Support Service, 62% was on call and the rest through email. 71% of the students preferred connecting to the University through a telephone and about 45% preferred for Email support. About 12% of the students did not avail any of the student support service during their semester period. On further analysis found that students who did not use the student support service where lagging in their academic progress. Gender wise analysis of the communication medium preferred also shows (Table—1) call as the most preferred mode.

Table 1: Communication Mode Preference

Support Service Availed	Female	Male	Total
Did both Call and Email	10%	18%	28%
Did only Call	15%	28%	43%
Did only Email	6%	11%	17%
Did Not Call or Emailed	3%	9%	12%

When looking at the communication preference of students vis-à-vis their age, there is a shift in the communication medium preference from call to email (Figure 2) with the age. Younger students prefer to use the call to connect with the University than email. Table—2, details the mean age and the standard deviation of it. This is noticed irrespective of the Gender. It is the same observation irrespective of a student pursuing a graduate or undergraduate program (Table—3).

Table 2:. Age - Communication Mode Preference

Support Service Availed	Mean Age - Female	Mean Age - Male	SD – Female	SD - Male
Using Call	24.69	26.19	4.88	6.05
Using Email	25.02	27.06	5.40	6.34

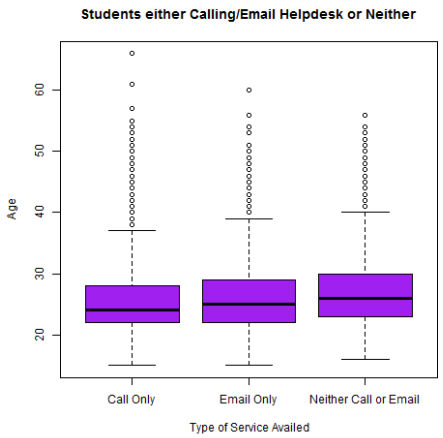

Figure 2: Age – Communication mode preference

Figure 2 also shows that as the age increases, students prefer to use email as the communication mode. Also, it shows that with increasing age, students prefer self-directed study guidelines/ videos to understand and complete the requirements.

Table 3. Degree Pursued - Communication Mode Preference

Support Service Availed	UG Degree		PG Degree	
	Mean Age (yrs.)	SD	Mean Age (yrs.)	SD – Male
Call	23.56	6.21	26.59	5.58
Email	24.59	6.71	27.08	5.71

The dataset was first analyzed to find the preference of communication media, across Gender, Age and the level of education. The results tabulated are as shown above. Further analyzed the dataset to check the interaction volume generated across these media, its frequency and its correlation with the user profile. Figure 3, presents the results. The active 28% of the student population used both telephony call and email to connect with the University's student support service for their query resolution generating 57% of the combined call and email transactions.

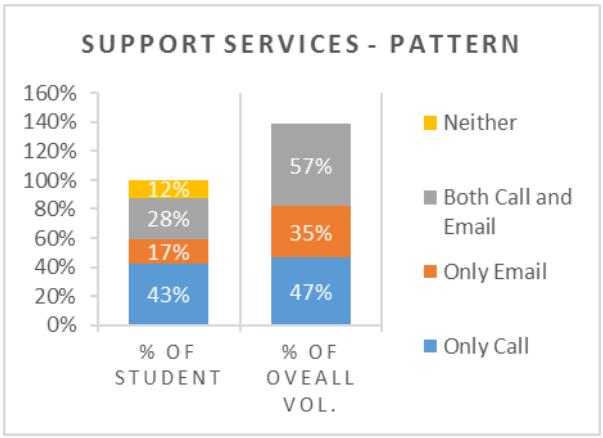

Figure 3. Student Support Service Transaction pattern

Addition information got unraveled on analyzing the profile of the students who did not use the student support service. For this, looked into the ratio of students re-registering to the next higher semester immediately on completion of a semester without break vis-à-vis who availed the support services. Found this metric relating to the student satisfaction measure esp. in distance education which by design supports students to pursue their academic progression at their convenience. The analysis showed that students who actively used the support services for clarifications/ support did progressed at a much higher rate when compared with the students who did not avail the services of the student support (Table—4).

Table 4: Students Progression

Student Support Service	Students Re-Registering to next higher semester
Availed	71 %
Not Availed	51 %

There is an increase of 20% in student re-registering to next higher semester who has taken the student support services when compared with students who did not avail the support. This correlates to the student's confidence in the Institution and the program pursued. This determines the eagerness of the student in learning and graduating the program in time.

A good student support also gives an assurance of support available on demand and a confidence that it does not leave students on their own to find solutions which they would need especially more in the distance education mode.

FUTURE SCOPE

This study has helped in exploring the student profile who uses the University's Student Support service the most and the reason for it.

This study throws open future scope to devise a better and improved system to reduce the number of student interactions with the support service, focusing mainly on the students who actively used both the call and email communication media at the same time for the same cause. A new integrated system which would immediately inform the student of their concern about getting registered and direct the student to wait for the resolution irrespective of the communication media used first for the cause.

Future research can consider the dataset of other similar Universities which offer distance education to analyse the student profile and their connecting pattern with the student support service along with the areas where they need support.

The study to extend to include the use of online learning resources, attendance in counselling sessions to analyse the impact of student support in learning continuously.

A similar study extended to other domains such as Telecom, Online Healthcare and Travel industries for support services. This will help to identify and establish any pattern if found on the user profile and the media frequency of usage to get their queries/ concerns addressed.

CONCLUSION

The primary objective of this paper was to study the student profile of distance education, how they are using and taking the advantage of the Student Support Service. How it has been supporting in their academic pursuit and its impact in improving the student satisfaction, student retention and success rate of students completing their degree program.

The study shows that female take up distance education as an alternative at an early age when compared with the male.

The study also shows with higher the age, students use email as the preferred communication medium rather than the call. They wish to wait for their query resolution rather than an instant and immediate resolution as demanded by the younger students who prefer using telephony call to connect for their requirement with the University.

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TOWARDS INVESTIGATION OF ISSUES AND CHALLENGES IN FACULTY TRANSITIONS TO ONLINE INSTRUCTIONAL ENVIRONMENT AMIDST COVID-19: A QUALITATIVE STUDY

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ABSTRACT
The world has embarked upon a golden age of technology. In education, as in every other sphere of life, technology plays an important role. Unlike other countries, the use of technology in the Indian education system has been rudimentary, but the closure of universities and colleges to check the spread of malicious COVID-19 has catapulted the virtual learning into the spotlight in India. The present paper aims to investigate the challenges that higher education faculty experienced while transitioning from an offline teaching environment to an online instructional environment during the lockdown. A qualitative study was carried out with 20 faculty members teaching in higher educational institutions. Telephonic interviews were conducted to collect the data. Based on the data analysis, six challenges are identified and lastly few feasible solutions are being proposed to deal with them.
Keywords: COVID-19, Virtual Learning, Higher Education, Faculty Challenges, India.

INTRODUCTION-

Inertia.. a well-known concept of physics can be used to dictate not only the physical but also the mental tendency of human beings. This tendency of restraining change is evident in every mundane activity they carry out. For instance, taking the initial stage of lockdown into the spectrum, everybody restrained it even though it provided them with much-needed rest and safety. Although people don't welcome change due to the uncertainty of its consequences, the current global crisis, which has made even our future existence uncertain, demands for bringing change. This worldwide pandemic, namely, COVID-19 has jeopardized every sector of the economy. The irony in such prevailing circumstances is that the only way to bring some sense of stability and certainty is by adopting a few necessary changes. Like other countries, the education sector in India was the first to witness the shutdown in an attempt to reduce the spread of ferocious COVID-19. Since education is a prime contributor to the economic and social development of a nation, the education system of India needs to incorporate few changes in its teaching pedagogy approach to ensure continuity of learning that has come to a halt with the necessary social distancing. As digital education is an easy way to cover up this distance, it is a relief that the Indian government has already taken various initiatives like Swayam, Swayam Prabha, National Digital Library, NPTEL, with "Bharat Padhe Online" being the latest one to encourage online education in the country. Though these web-based learning platforms were present for quite some time, chalk and talk is the most preferred mode of teaching. However, this turmoil has forcibly brought e-learning into practice prominently. If this crisis-driven experiment with digital learning would be able to gain a foothold successfully, no wonder it will result in the creation of a new advanced hybrid education model that will transform the education system of our country. That education system would be very flexible and impregnable enough to cope up with the future unfavourable times. To turn this vision into reality, we need to shape our education system accordingly. Since teachers' are one of the most relevant pillars of the educational system, their experiences of teaching through an entirely different instructional environment during lockdown would be very instrumental for MHRD in designing helpful support and training schemes. Moreover, faculty members' substandard shift to online teaching mode creates negative impacts on the students, such as limited communication from learners to a teacher (Beebe, Vonderwell & Boboc, 2010) and poor feedback to enhance learning outcomes (Jordan, 2012). Buckenmeyer et al (2011) stated that post-secondary administrators, being short of information about the needs of faculty members for a successful transition to the online instructional form, are unable to offer plausible support and training courses. So, it is the need of the hour to explore the challenges that faculty members' encountered in the transition to a digital form so that their transformation could navigate smoothly. In this context, this paper presents with the following research question:

"What problems did the faculty members face on switching to digital teaching during the lockdown period?"
The remaining part of the paper is into five sections. Section 2 states the objective of the study, followed by the section 3 describing the research methodology used, followed by the section 4 highlighting the problems faced by faculty members while teaching digitally. The second last section offers a discussion of the study. The final section presents the conclusion.

OBJECTIVE

The core objective of this paper is to investigate the higher education faculty members' difficulties in transitioning from an offline teaching environment to an online instructional environment during the lockdown.

RESEARCH METHODOLOGY

This study employed a cross-sectional qualitative study design. Faculty members teaching in higher educational institutions in tier two cities were interviewed telephonically from 4th April to 12th April 2020. They asked to share the difficulties faced by them in teaching electronically. Faculty members of Lucknow and Kanpur contacted for data collection. Interview of a total of 20 faculty members teaching in the department of commerce, economics, or management conducted from the above cities. Convenience sampling was a technique for data collection.

FINDINGS

Few significant verbatim accounts touching upon different challenges of online teaching experiences have been encapsulated in the following table:

Challenge	Verbatim Accounts
Student Engagement	"I have experienced many students chatting instead of paying attention during the class thereby disturbing the focussed students too". "I have noticed few students switching their camera off purposely during the class just so I can't gauge their degree of attention and interest in the topic under discussion". "While I teach, my students listen passively but when I start asking questions to test their understanding of the topic, they either make excuses' about not being able to hear the lecture properly due to breaking up and echo of sound resulting from bad bandwidth at their end or leave the class immediately". "Even after I share videos and other required notes in the Google classroom for reference and discuss the same in virtual classroom, submission rate of assignment is very low. If I quote in figures, only 20% students of my class submit their assignments on time followed by 5% who submit late as per their convenience and rest of them never submit". "Surprisingly, many students of my class often ask me for notes and videos that I already posted on whats app several days ago. It seems to me they don't even download them to read or watch and leave them unattended".
Control over class	"Well...As far as my experience is concerned, I don't find any major difference between virtual and physical classroom except my control over the class. My control over physical classroom is quite good as all the students sit attentively, quietly and stay on time. On the contrary, in my virtual classroom, many of them either attend the class with a casual attitude or join late. Sometimes, few students join when the class is about to get over just for the sake of attendance. These kinds of behaviour impede effective learning".
Technical issues	"It frustrates me as a teacher, when an easy going and smooth sailing class suddenly gets disconnected or freeze in between due to bandwidth problem. Whenever this happens, I, even after putting lot of efforts find myself unable to create the same learning environment and teaching pace after rejoining or resuming". "It is painful to hear students often complaining about not understanding properly what I delivered because of technical issues like breaking up of my audio, echo in sound, delaying in my sound, blur presentation, slow updating of presentation etc." "My files which are lesser than even 140 MB don't usually upload on Google classroom easily and keep processing even after 14-15 hours because of poor bandwidth or other technical issues. I have to cancel uploading and reload it repeatedly until it's done. This situation is really vexing". "Poor bandwidth compels me to ask my students to put off their mikes while delivering lectures. As a result class interaction which holds a great significance gets vanished".

Technical Literacy	"Many times I face a lot of trouble sharing few files/ppt/videos with my students. Often whenever I come across any file, video or ppt while surfing that can be very helpful to my students, I download it. But later at the time of sharing, it just won't open in my device due to compatibility issues. Being technically less sound, it's tiresome for me as I have to poke my head a lot to fix this kind of issue. However, my frustration reaches to its peak when few students still complain about the files/videos/ppt which I had shared being incompatible with their devices."
Technical Acclimation Struggle	"I have been taking physical classes for last 20 years. Hence, conducting classes with zoom app was unpleasant news for me. A teacher is always open to learning but being non tech savvy, I am quite apprehensive about going digital and this nervousness often appears while taking class". "I spent my two days learning how to operate Google classroom and zoom app from one of my technically sound friend when our principal announced to teach digitally. Now I am getting used to of these apps day by day. It is surely a good opportunity for a novice like me though it comes up under unfortunate circumstances". "I have managed to easily learn the basics of the apps employed for teaching through digital mod but sometimes I bump into few problems upon their usage. Luckily, I figure out the solution with the help of few technocrats. It is now like learning by doing for me." "Wow! It is fun taking classes virtually because of the opportunity of exercising the computer skills that I learnt during my school days."
Time and Energy Drain	"I am finding virtual teaching much more exhausting than physical. In physical classroom I used to start the topic and teach simply using my expertise in least external disturbances. After teaching the topic I used to dictate notes directly in the class or provide key points to students and ask them to make themselves on the discussed guidelines. On the contrary, while teaching digitally I need to take care of both academic and technical issues. In virtual classroom I have to repeat points many times due to external disturbances like technical glitches and background sounds and provide students with tailor-made notes too. This is very hectic and tedious." "Since I choose to make my own videos of teaching rather than sharing links of available videos made by others because I know my students' learning capability and needs better, digital teaching is energy draining for me. For a subject like Operation Research, Business Statistics, Concept valuation, Accounts, Income Tax etc, explanation of even a single concept requires at least 20-25 minutes. Making video of them, compressing them keeping in mind the quality and then finally uploading those takes up a large portion of a day. It is very tiring."

Discussion-

i) Student Engagement

Since the dawn of time, the proficiency of any teacher has been assessed by gauging their expertise in their field and the ability to engage the students. Attracting student attention and raising their interest, curiosity, and concentration to involve them in the class has always been an arduous task for teacher fraternity. But, digital teaching has made student engagement even more strenuous by severing a prominent tool that gave teachers an edge - physical interaction.

Various teachers experienced that in the virtual classroom, due to the elimination of physical interaction, all other additional perks supplemented by it like control over the class due to the fear and respect of teacher physical presence, student involvement born out of teacher body language, and way of speaking, effortless monitoring of students' concentration and attention by reading their actions, easy steering of the class instantly by ascertaining students' frame of mind, the impact of disciplined study environment, automatically get suspended.

Recommendations-

Although online teaching makes the struggle of student engagement even more herculean, there are several ways of easing up the process.

Multimedia should integrate into the design of e-content in a manner that automatically attracts students' attention and interest (Almala, 2005). E-content should adopt a tempting and engaging approach of teaching by the inclusion of pictures, colours, quizzes, examples, easy-going language, and explanative short videos. Gamifying techniques should use which award students with points or catchy titles and divide content at different levels ranging from easiest to most tough to allure them into studying through peer competition.

In the case of virtual classrooms, innovative techniques should employ to tackle the problem of mono-channel communication. Rather than being monotonous, the teacher should use captivating ways to bring each student into action and help them keep up with the pace of the class (Juan et al., 2011). Since peer interaction, motivation, and competition have always been ultimately engaging, the practice of 3Cs (create, conceive, communicate) should adopt. In this activity, primarily groups of students formed. Then they are provided with a topic or case study to be discussed and conceived, and finally, they communicate their ideas or thoughts on the given topic/case in the class. In this activity, there is no right or wrong answer and is conducted by the teachers to gauge students' knowledge level of the topic they are about to discuss. It helps teacher design their lectures such that they are easy to grasp for every student, therefore engaging them.

Secondly, to grab student attention, a few minutes at the beginning of the class should be allotted to "recalling session" where different ways should use to check what students remember from the last class. It may include a rapid-fire round of questions crafted by students themselves to ask from each other or a normal JAP (just a point) activity with students of teacher's choice where they have to tell only one point which they can recollect from the last class. It will automatically ensure students' attention in class due to fear of peer defamation.

Moreover, once two or three topics are completed, revision classes should be held unexpectedly to strike on students' memory and help them memorize what has been taught. In this, the teacher may ask students to prepare a few questions to be asked from others thus ensuring both his and other students' engagement in an enjoyable manner.

Other than this, in the presence of a teacher breakout room discussion, open chat room discussion among students on any specific short topic can also be conducted.

ii) Control

Teaching students and driving a car have a lot in common. To drive a car, you need to have control of the wheel even if it's ignited to ensure it goes in the right direction. Similarly, even after student engagement, teachers need to have control over them.

Teachers have realized that digital teaching has obliterated the control that they had over the students in the physical classroom. Discipline and sincerity in students born out of fear or respect for the teacher's presence and impact of the educational environment have completely vanished. Thus, making students' approach to online education very casual. Students have stopped keeping up with the pace of the class, doing assignments or homework, and even studying seriously because they think there is no way a teacher can watch, assess, or control them.

Recommendations

Once teachers employ all the possible ways of ensuring student engagement, they can establish control by using a few simple practices and techniques.

Teachers themselves should exercise behaviour that portrays discipline, class ethics, sincerity, and seriousness so that students can reflect the same behaviour. Teachers should establish and communicate rules and regulations of the virtual class beforehand like the use of a gesture to seek teacher's permission before speaking in the class, no off-topic discussion in the chatbox, formal dressing, sit in a peaceful study environment, etc. Each day, a welcome slide having greeting caption, picture of a quiet and disciplined classroom, and golden rules for the virtual classroom should share with the students until the teacher is letting them in the virtual classroom. By doing so, students will remember and uphold the rules. Besides, involving students in creating a code of conduct for a virtual class, a teacher can increase its acceptability and compliance. To control students with critical and constant uncontrolled behaviour like late submission/non-submission of assignment, disturbing the class by posting useless and abusive messages in the chatbox, late classroom entry, etc. teachers need to go a bit out of the way. They will have to be vigilant and sort out students showcasing such behaviour consistently. Then, rather than correcting them in front of the class, teachers should arrange a personal one on one counselling session with them to reach to the core reason for their misbehaviour. In this regard, a teacher can converse with their parents to explore in-depth. If there are some personal reasons, then they must refer to the counselling department of the

college or any other external psychologist depending on the availability. But if they are misbehaving because they do not understand or catch up on what is being taught in the class, then teachers should themselves gather such students and arrange an extra discussion class separately for them.

Such an empathic approach will lead to a more positive response and a better teacher-student relationship. Therefore, a teacher should prefer to take punitive actions against the students like marks cut, barring late class entry, or removing them from the virtual class in the end when he discovers students are consciously and deliberately showing deviant behaviour.

Additionally, parent-teacher regular communication should be held to monitor student sincerity and develop proper control over them.

These friendly but firm approaches can enforce control in online teaching.

iii) Technical issues-

This current pandemic has taught us that uncertainty is inevitable. It has made us realize that we should be fit enough to withstand any unpredictable challenges that our future holds. When taking Indian education into the spectrum, the inclusion of online teaching seems to be a promising step towards ensuring that. Though, lack of ubiquitous technical advancement in India makes it a very challenging and strenuous task. The internet launched in India in 1995. Currently, we are living in 2020. It's deplorable to know that still several remote and rural areas are technically deprived and face constant network and low bandwidth problem. Not only them, but also many tier-2 cities struggle with low bandwidth situation. All these issues are supplemented by unavailability of technical resources at student's or teacher's end in some of these areas. Moreover there are many educational institutes themselves that are financially humble and can't arrange required ICT infrastructure. As a result, lack of technical development becomes a biggest hindrance in our goal of adopting digital approach in our education.

Recommendations-

It's high time we understand the simple rule of survival of the fittest. Rather than sticking only to primitive chalk and talk method due to our underprivileged technological conditions, we must be resilient and put our efforts and focus on bringing technical advancement to help us go digital.

The government can collaborate with private internet service providers and help them install more and more mobile towers in remote and rural areas as well as tier-2 cities. Additionally, it can provide needed support to bring higher generation internet in our country and also launch beneficial schemes to allure the service providers for supplying high-speed internet at a cost-effective price.

Moreover, India can design its own application for virtual classroom and e-content sharing, keeping in mind its internet speed and availability of other resources.

Apart from these, the government should grant affiliation to educational institutes only if they have proper ICT infrastructure and should sanction additional budget specifically for the supply of technical resources to financially deprived institutions.

iv) Technical Acclimation struggle-

'Change is inevitable. Growth is optional'.

This quote of John Maxwell describes the current scenario perfectly. The current crisis has brought change not only in our habits but in every other aspect of our lifestyle. Even after it will be gone, it will leave a revolutionized world with a changed mindset and approach towards its general working. And if we as a country don't adapt accordingly, our growth will come to a halt. The same applies to our education system. We have seen how adopting digital teaching is an encouraging bet and future of education. Still, we can see the hesitation in both teachers and students about the same.

Limited technical literacy and technical issues are already making teachers quite apprehensive about employing tech-driven teaching methods (Fein & Logan, 2003; Osika et al., 2009).

But, apart from them, the resistance of adaption of technology is evident as an issue in itself as many well-equipped institutions with all the required facilities available, too choose for primitive and traditional methods of teaching.

Recommendations-
Suddenly switching to something completely different is difficult for everyone, especially if we have to fight off our traditional mindset. But, once we start understanding the benefits and necessity of change, the process of adaption becomes much quicker.

Thus, teachers need to understand the benefits of e-teaching, its scope, different opportunities that it provides, and exciting new things it can facilitate that physical classroom could not offer. Additionally, engaging in a discussion about it with other colleagues and personally getting interested in knowing its facts, innovative features, perks, etc. can spark temptation and fascination towards digital education.

MHRD should conduct refresher courses covering the latest technology and tools for digital teaching frequently to keep faculty members abreast of the latest developments. This exercise will make faculty members comfortable in using technology and reduce their resistance to the adaptation of technology. Apart from these, the government can also make informational advertisements that highlight the benefits of online learning and boast about its advantages to captivate and attract teachers. Setting "going digital" a trend will automatically attract teachers to take part in it enthusiastically.

v) Technical literacy-
This is a tech-driven era. Technology has set its foot on everything ranging from business to education and undoubtedly increased their efficiency. Based on the circumstances caused by the current pandemic, the tide of technology is going to transform the general working of all the sectors by making its role even firm. This time demands for change in Indian educational methodology too. Since, time and tide wait for none and this increasing role of technology has made technological proficiency a must-have skill, we must focus on inculcating it. Currently, considerable number of Indian teachers is still digital migrants (Singh, 2016) and hence their graspe on technology is not very strong. Additionally, many institutions give less importance and preference to technical mode of teaching even after being financially stable. Consequently, putting even technically sound faculty out of practice. Previous studies explored that many faculty members are not fully prepared to teach via electronic mode because they are still making themselves ICT sound by acquiring the knowledge to use some of the online learning platforms (Jaques & Salmon, 2007; Little-Wiles & Naimi, 2011; Rucker & Downey, 2016; Thorsteinsson, 2013).

Moreover, even though government has mandated computer education in every school, many students are unaware of its practical approach and real life applications.

Recommendations-
Current circumstances present itself with the pressing need of bringing change in our educational methodology to make it more resilient. In order to do so, we must begin from training the faculty who will apparently teach students. In this reference Allan et al., (2012) stated that training would guide teachers to handle ICT platforms and identify educational needs of their learners effectively. Gerrard (2005) also pointed out the requirement of two types of training for instructors involved in online teaching. "Training is vital how to academics utilise pedagogy in the e-learning environment, how do they adapt learning style in their material, correctly using the e-learning features are important, if academics do not know then investment will not yield the expected result" (Islam et al., 2015, p.107).

There should be occasional out-house training making faculty aware about latest technology and its usage in education. These trainings can be real time or recorded and then broadcasted to many institutions together to save the budget. Several special lectures should be scheduled to let teachers know about recent technical advancements and innovative online teaching tools and methods.

Additionally, institutions can start regular in-house training sessions for technically backward teachers hosted by its own tech-savvy faculties to save budget.

vi) Exhausting and time taking-
I found what many teachers complained about online teaching was the same as what I used to complain about riding a bicycle as a newbie. In the beginning, I'd indeed prefer walking than riding a cycle where I had to maintain balance, paddle, keep an eye on the road, escape from traffic, and use my energy all at once. Similarly, not only technically novice teachers but also tech-savvy ones are finding online teaching very time taking and energy drenching (Anderson et al., 2011; Capra, 2011; Mbuva, 2014; Mihhailova, 2006; Tunks, 2012). Teachers take twice as much time as a physical class to prepare and teach the same topic through online mode (Cavanaugh, 2005).

In case of e-content, they find searching for good study material and subject related videos, sometimes self preparing them according to their students, compressing video content accordingly, uploading them, etc very hectic and cumbersome task. Similarly, for the virtual classroom, unlike the physical classroom, teachers have to prepare the bullet points to discuss beforehand and come up with various innovative ways of engaging students. Besides, in the virtual classroom they have to put an extra effort to keep control over students and make class both perceptive and topic-focused to avoid wastage of net. Also, they require to go extra-mile for checking the pace and level of each student, etc. Moreover, maintaining strong presence on digital discussion boards and answering private questions of students as soon as possible is also time-absorbing. After all these tiresome tasks, they automatically develop a preference for chalk and talk method of teaching.

Recommendations-

I learned that cycling would take me way farther effortlessly once I become perfect in it. Similarly, teachers need to understand that tech-based teaching can be a lot more productive, easy, and fun once they become proficient in handling it. And this proficiency can attain by practicing willingly and enthusiastically.

Once they are ready to go the extra mile, in-house, and out-house training provided by institutions can remove their uneasiness and employing technology-driven teaching methods can ensure practice that they need. Thus, it will be gradually instilled in their lifestyle effortlessly.

Faculty members should provide distinctly and concisely crafted learning materials to the students so that they don't require further clarification. They should adopt an easy-to-follow pattern in designing learning materials so that students don't feel confused and lost. Even if they are using available learning materials to share with students, they should first organize it in an easy-to-follow pattern. In this regard, they can e-mail weekly modules to the students that contains highlighting on work to be done daily and on the text that requires first reading.

Teachers can set a time for themselves to be available online and announce this so that they can free up themselves from the act of checking and posting too frequently that is burdensome for both the faculty and the learners. Additionally, they should provide answers to individual learner's queries in the announcement area to help students' having the same kind of questions while saving their time.

Besides, the government can set-up a mentoring group consisting of experienced online instructors who have already run online courses successfully to help the faculty members in their transition. It will surely help the teaching fraternity to streamline their efforts in the right direction and prevent them from getting entangled in the time-sucking activities.

The government can also reduce span of control for teachers i.e. lesser number of students under a teacher to reduce their workload and save time.

Additionally, government can tie up with IT companies to come up with a digital learning toolkit that is compatible with all the devices, runs on low-bandwidth and include many features like file converter, file compressor, presentation maker with audio and video option, live classroom for at least 100 students, automatic attendance tracker, attention tracker, content-builder supporting images, texts, audios and videos, video compressor, skill mapping, performance tracker, teacher-student doubt clearing forum, polls and quizzes launcher, boardroom and other innovative features. Precisely, the app should have complete teaching and assessment tools in it. Every college and university should have an account on this application as mandated by government. Besides, there should be an experienced technical support staff that deal with any technical or general problem teachers or students come up with regarding the usage of that application and continuously engage in knowing instructional needs of instructors for developing or identifying time saving innovative tools.

Conclusion-

This paper highlights the six difficulties that the teachers are experiencing in their transition from classroom teaching to the virtual form of teaching and how to overcome them. The first challenge in an online education setup is student engagement. To engage students, the teacher should use multimedia in their e-content and include activities such as 3Cs, recalling sessions, and JAP just a point during online classes. The second challenge is to make students attend the virtual class with discipline and sincerity. It can achieve by setting a code of conduct for a virtual classroom in consultation with students, conducting one on one counselling sessions for indisciplined pupils, having parent teacher communication frequently, and mild punitive actions. The third and most important challenge where the teacher does not have much role is internet connectivity. It calls for government participation. The government should encourage IT professionals to come up with different

educational apps that run on low bandwidth, grant financial aid to academic institutes for their technical advancement, and ensure a proper state of the art ICT infrastructure. The fourth challenge is teachers' resistance to the adaptation of technology. Teachers should accept the reality that digital learning is going to be the new normal. So they should focus on acquiring the required skill set to survive the new change. The government should also reinforce this fact by focusing more and more on the advantages of going digital. The fifth challenge is limited technical literacy among the teachers. The government should come up with more and more training programs to impart technical skills to them. The last challenge is the exhausting and time-consuming nature of digital education. Once the above-mentioned challenges are being taken care of, this issue will partly be addressed. For the time-saving part, the teachers should set a definite time for their online presence, provide solutions to queries in the announcement area, and seek help from experienced online instructors. The government can reduce the burden by assigning lesser students per teacher and providing them with technical assistance. More challenges might appear if the government of India carries out a comprehensive and wider study of all the snags and loopholes of digital learning. This will help to come up with an efficient digital platform that will have last-mile outreach.

Limitations-

This study has certain limitations which are-

Faculty members teaching in the colleges of higher education of Lucknow and Kanpur are taken as respondent.
Most of the participants are digital immigrants as they were raised prior to digital age.
Sample includes faculty of commerce, management or economics department exclusively and teachers of science, mathematics, foreign language and humanities departments are not included.

Future Research-

This study can be replicated with faculty teaching mathematics, foreign language and science as respondents to explore challenges cropping up before them while teaching digitally.

A study can be carried out to explore general and subject-specific training needs of faculty for successful and smooth transitioning to online instructional environment.

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