Need Assessment of Spiral Curriculum in Teacher Education: Context to Covid – 19

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Abstract
1.7 billion Learners were affected globally with educational institutions closures during the COVID-19 outbreak. India has the world's second-largest school system, after China. Shutting schools to maintain social distancing during the COVID-19 crisis was the most logical solution to avoid community transmission in the initial response to COVID-19, given uncertainty over transmission rates among school-aged children and the potential impact of the virus. All education institutions in India were temporarily closed in March 2020. Since the pandemic, education has changed is never going to be the same in the terms of the educational pedagogies. This study focused on the need assessment of spiral curriculum in teacher education due to COVID-19. In the study, a three-point scale for the questionnaire was used to collect educators. A total of 45 teacher instructors responded to the questionnaire that was exploring the opinions of the teacher-instructors about the practical work of the spiral curriculum and collecting suggestions for intensifying the practical work of the trainees. The findings suggest that there was learning loss during the covid19 pandemic due to less classroom interaction, collaboration and peer support and technical difficulties. Further, there was aa digital literacy and technical difficulties that made learning practical work not so possible. The learning outcome proves a need of spiral curriculum in teaching for the learners to gain he skills that was intended in the B. Ed course.

Keyword: spiral curriculum, learning gaps, digital literacy, teacher education, online collaboration

Introduction

The Covid-19 epidemic has caused outcry all over the world. Two years have passed but uncertainty still lingers. This epidemic has affected every sector of society. This has many positive and negative effects on trade, commerce, health as well as the education system: With the proliferation of Covid-19 in early 2020, all educational institutions to stop offline teaching and started thinking of alternative systems (ECLAC-UNESCO, 2020).

In India too, when the complete lockdown was implemented on March 2020 (UNICEF & UNESCO, 2021), according to the academic calendar, only the students' semester exams were to be held. In a developing country like India where the spread of other alternative ways of teaching such as online education was very low, the situation of total lockdown has made the government as well as educational institutions think about other ways of teaching.

The fury of Covid-19 was growing and gradually with the passage of time, the guidelines on planning of examinations and admission in the new semester were declared by the Government of India and UGC. The admission process, which usually takes place in June - July, was extended to October. The government decided to provide education keeping in view the Covid-19 protocol and gave special priority to online teaching. The online education system has proved to be a blessing. While offline face to face education system was not possible, online education system has done a very important job.

Online education has spread to a large extent in every discipline as well as the field of teacher-training where future teachers are to be prepared. It is not 100 per cent possible in the online education system to teach some of the skills and methods required for the profession of teacher to the trainee's taking admission in this course. Trainees must observe the lessons given by the professors and teach lessons based on their different skills. The college has the necessary physical facilities. Teacher-instructors and other trainees act as classroom students to observe the trainees' lessons. Thus, the effectiveness of the teaching of trainee's increases when training is given.

As a teacher- instructor we need to train future teachers. They need to be aware of the classroom conditions. Trainees are required to provide lessons with the necessary physical facilities. If trainees give micro-teaching lessons or simulation lessons from home, its effectiveness will not be like that of offline education system. Thus, the trainees who have taken admission in B. Ed after June 2020, have given microteaching and simulation lessons in semester - 1 online only. As in school education and in higher education students are likely to have some degree of study deficit, similarly B.Ed. trainees have also to face disadvantage due to lack of training and the impact is not immediate but can be felt when they join the profession. That is why the investigator has conducted the present study to know the opinions of teacher-instructors about what can be arranged for training of essential practical tasks for the trainees who have got admission in the course in academic year 2020 – 2021 in B. Ed. course.

1. Literature Review

The concept of spiral curriculum was first coined by Bruner in 1960. According to Bruner a spiral curriculum is one in which there is an iterative revisiting of topics, subject, or themes throughout the course. A spiral curriculum is not simply the repetition of a topic taught. It also requires the deepening of it, with each successive encounter building on the previous one (Harden & Stamper, 1999).

In a spiral curriculum design, fundamental ideas (ideas with wide applicability) are taught at all levels in an age-appropriate way. Bruner explains, "The foundations of any subject may be taught to anybody at any age in some form. Although a young student may not be able to understand all the technical aspects of advanced concepts, he can understand all important ideas on an intuitive level. This intuitive learning is like the learning process used by researchers to discover new knowledge and is intrinsically motivating (Bruner, 1966).

Students visit previous material for ranges of reasons, a large number are aware of the spiral curriculum, and use the online environment to build upon previous material. Any practice, which entails replacing material and redesigning curricula content may be detrimental to the students' future learning needs, and such activities may need revision (Masters and Gibbs, 2007).

Davis (2007) found in his study that majority of the subgroups studied did show statistically significant differences in effectiveness for the experimental spiral physics curriculum compared to the traditional linear physics curriculum. Further, The finding of Fowles (2021) suggest that a spiral approach to teaching mathematics supports academic growth. Additionally, the findings suggest that more students had a positive outlook on their learning when the content spirals. This has implications for teachers who wish to increase student mathematical understanding and boost student feelings about learning mathematics.

The opportunity for consolidation of previously visited knowledge was a perceived predominant advantage, with re-visitation of topics helping to deepen understanding and learning. Clarity on the depth of knowledge at each stage prevents information overload. A spiral curriculum must spiral and not be a repetition of previously delivered topics. (Coelho & Moles, 2015).

Study reveals that the spiral curriculum model is very helpful in that it allows student to learn and acquire the skill of writing in a gradual and systematic way to move from the previous knowledge and build on it to acquire the next knowledge. Thus, the study recommends implementing Bruner's views in designing the courses of writing (Khatayabeh & Ateeg, 2011).

2. Methodology

The study adopted the survey method for data collection. The participants of the survey in the study were teacher instructors of Bachelor of Education College were included in the population of the present study. In consideration of social distance bylaws, Google Form was constructed to investigate.

An online Google Form was developed by the investigator to collect data, which was comprised of 26 questions in the form of three-point rating scale. Statements were related to teaching of the practical tasks done online by trainees and if necessary, need to re-teach the same points or practical works as the spiral curriculum to the trainees who have got admission in B. Ed in academic year 2020-2021 and done all the tasks like microteaching, simulation lessons and other practical works online only.

The 26 questions in the questionnaire were distributed in themes that could point out the need of spiral curriculum in teacher education in context to Covid-19. The table 1 demonstrate the distribution of the questions.

Table 1: Distribution of questions in the survey questionnaire

No	Theme	Number of Questions
1	Course enrollment	1
2	Class interaction and learning feedback	6
3	Collaboration and peer support	3
4	Technical difficulties	2
5	Digital literacy	7

6	Learning outcome	5
7	Learning gaps	2

Results, Findings and Discussion

Course enrolment

The outbreak did not only disrupt the learning pater, but every aspect of education system was also. While adapting to the new norm, the teacher instructors were asked on the course enrolment if it could be delayed or continue as it was, the results are reflected in table 2.

Table 2: Teacher instructors' responses on admission and enrolment of students (n= 45)

Question	Agree	Neutral	Disagree
The admission process at various higher education institutes could be delayed due to Covid-19 pandemic. So, the actual hands-on & practical exposure to students across various streams must have lagged in context to their curriculum.	84.44 %	0.00%	0.00%

The teacher instructors feedback indicates that, as a system, the education was not ready to adapt quickly to the changes, and hence there was a delay in the enrolment. The same supported by UNICEF (2020) report indicating various countries halted the learning process to figure out the best way to do it during the pandemic. The educational institutions were not ready for the social change and took time to adapt to the new norm after the outbreak.

Class interaction and Learning Feedback

Interaction of teachers and students is one of the critical part of learning process (Jing, 2021). However, UNICEF (2020) found out that during closure the nature and frequency of interactions changed from how teachers engaged with learners, provision of tasks and feedback. Findings from the instructors' feedback in indicated that there is a large difference between face-to-face education and online education. Experiences of offline classroom learning cannot be provided by online teaching as the summary of instructors' feedback in table 3 indicate.

Table 3: Teacher instructors' responses on class interaction (n= 45)

Question	Agree	Neutral	Disagree
Trainees should be informed about effective classroom interactions.	75.56	24.44	0.00
It is imperative that individual feedback should be given to trainees by observing their lessons.	75.56	24.44	0.00
Online/Virtual mode of teaching was found ineffective in teaching teacher trainees.	37.78	33.33	0.00
The online medium was found unsuitable for practical sessions.	80.00	20.00	0.00
Training of microteaching skills could not be imparted in online teaching.	88.89	8.89	0.00
Training of simulation could not be provided properly in online teaching.	88.89	0.00	0.00

More than 75% of instructors believe that learners must be informed about classroom interactions, learners were used to face to face interactions and now they were in online interaction which they were not used to. Further, 80% of instructors believe that during the online learning it was not suitable for practical session as there was no interaction. However, only 37% agree that online mode was ineffective, which indicates to some extent the instructors managed to perform classes and interacted with learners.

The instructors' feedback are supported by Sternadel (2021) findings indicating that in learners lost around 50% of their contact time with their teachers during the pandemic. On the same, Pokhrel & Chhetri (2021) argue that the time lost because the initial interaction was face to face, and teachers were technologically illiterate to innovatively create new interaction during the pandemic. Further, UNICEF & UNESCO (2021) reports basic internet connectivity in some parts of India and unreliable power supply resulted to reduction of interaction time

while attending online lessons as well as the structural arrangement of education curriculum and the approved teaching methods.

Collaboration and Peer Support

Collaboration and peer support are among the aspects that is important in learning and was much affected during the pandemic. Students were not able to collaborate effectively in the projects and missed the opportunity to have peer support as it was during the face-to-face learning as supported by the instructors replies in the table 4.

Table 4: Teacher instructors' responses on class interaction (n= 45)

Question	Agree	Neutral	Disagree
Online teaching of certain methods of simulation could not be imparted thoroughly to the trainees.	82.22	8.89	0.00
Most of the trainees do not have enough study materials at their home.	64.44	11.11	0.00
Trainees have a collective disadvantage as they cannot learn with their peer group in online teaching.	60.00	24.44	0.00

In face-to-face learning, learners used to share resources which were not possible during the online learning. 64% of instructors agreed to the statement that the learners did not have enough material for studying at home which when they were attending schools they shared with their peers. Also, 60% of instructors admitted that learners missed the opportunity to have their peer group to gain support during the learning. Further, learners could not understand some of the lessons online, which would have been easier when they collaborate or receiving peer support in understanding difficult concepts.

Moreover, the results are similar to Özüdoğru (2021) findings that learners were not able to communicate effectively and collaborate with friends. The learning management system focused more on lesson delivery and not collaboration of learners. However, Pokhrel & Chhetri (2021) argued that the online learning provided more opportunity to physically challenged students with more freedom to learn from anywhere they are. To ensure learning continues and teachers initiate collaboration during online learning UNICEF & UNESCO (2021) suggests a creation of teachers 'tech-savvy' generation that is capable to teach in online setting innovatively and deliver the quality education using online means.

Technical difficulties

During the closure od schools, e-learning tools facilitated learning and helped schools to be on loop and study continuation (Pokhrel & Chhetri, 2021). However, technical difficulties/challenges obstructed learners' participation to online as indicated in table 5.

Table 5: Teacher instructors' responses trainees' technical difficulties (n= 45)

Question	Agree	Neutral	Disagree
Trainees are facing difficulties in appearing for online lessons due to lack of technical facilities.	100.00	0.00	0.00
Trainees appearing for online micro lessons and simulation are unaware about the issues of real classroom.	100.00	0.00	0.00

All the respondent teacher-instructors have opined that the trainees faced internet and other technical problems while teaching online. In addition, micro-teaching and simulation training could not be provided effectively online. The effects are likely to be felt in the future when trainees join as teachers.

The issue of technical difficulties and connectivity is also reported Pokhrel & Chhetri (2021) by highlighting unreliable internet connection and some families not being able to buy the device for online learning. Further, Özüdoğru (2021) reported the issue of sound problems and live sessions connection which is also noticed by Mahyoob (2020) in connection to using blackboard in accessing online classes.

On the same UNICEF (2020) argues that in some places, only 10% of the population have been reached by online platform. Being online needs electricity, internet, and reliable devices which some are not afforded by several households. Further, rural teachers found it was hard to reach learners during online learning than it was to the urban learners.

Digital literacy

The lockdown after the COVID-19 pandemic force the education system to go fully online. It was the time the digital divide gap was evidently seen in the most communities. According to UNICEF (2020) there is significant gender digital divide, where girls are less favorable in owning devices or having access to online tools which

made them not to afford staying online. Further, Pokhrel & Chhetri (2021) argues that to use the pedagogy for online learning, teacher and learner should have the devices and the digital literacy to use the devices for online learning. The table 6 are the instructors responses concerning digital literacy during the Covid-19 online learning.

Table 6: Teacher instructors' responses on digital literacy (n= 45)

Question	Agree	Neutral	Disagree
Proper training sessions could not be executed for teacher trainees due to Covid-19.	82.22	8.89	0.00
Micro-teaching skills could not be effectively explained to the trainees.	88.89	8.89	0.00
Trainees could not learn effectively & efficiently through online medium.	75.56	8.89	0.00
Teacher Educators could not provide online demonstrations of all the necessary skills.	100.00	0.00	0.00
The trainees could not imbibe what was to be learnt from the teacher's behavior.	100.00	0.00	0.00
The objectives of the hidden course would not be clarified & transmitted to the students.	84.44	15.56	0.00
Trainees are found unaware about the realities of the real classroom or demonstrative classroom situations.	84.44	15.56	0.00

Teacher-instructors are not able to effectively present information or presentation of the skills that are required to be learnt in the classroom as a teacher through online medium. According to the opinions of most of the teacher-instructors, online medium to micro teaching skills could not be imparted to the trainees effectively. They couldn't demonstrate micro-teaching lessons properly online.

Moreover, the results indicate proper training was not done, lesson could not be explained to students and the objectives could not be clarified. Further, teacher educators were not able to demonstrate necessary skills which Özüdoğru (2021) suggested it was caused by the instructors being not accustomed to the system and have not possessing digital literacy skills to enable them to handle online teaching successfully. However, Aditya (2021) is against the idea of teachers not having digital literacy as they have shown personal initiative to utilize the devices although in minimal level.

Furthermore, online learning will be a mode of learning for some time now, even when not fully online, but institutions will utilize more compared to the pre Covid-19 outbreak. As such, school communities and administration must get ready and prepare the schools to be digital schools with future ready access (UNICEF & UNESCO, 2021) and focus on continuous teacher professional development to fill the literacy gap of teachers (Tejedor et al., 2020).

Online or distance learning will remain the preferred mode of teaching and learning whilst the pandemic is still prevalent Attendance must not be enforced and must depend entirely on written parental consent

Learning outcome

The schools were closed, with no hope of being opened in the near future and based on the length of school closure the teacher student time were reduced. Academic activities were disrupted, and instructors' feedback in table 7 are indicating the rate of the learning out come during the online teaching,

Table 7: Teacher instructors' responses on class interaction (n= 45)

Question	Agree	Neutral	Disagree
It is mandatory for trainees to effectively learn the essential skills needed for a teacher.	73.33	26.67	0.00
There is a difference between actual physical classroom training and online training.	100.00	0.00	0.00

Actual in-person re-teaching/remedial sessions of microteaching should be arranged for trainees.	75.56	24.44	0.00
Specific planning should be done for microteaching & possibly it can be executed vis-à-vis as a bridge course.	75.56	24.44	0.00
As teacher instructors, we are too generous towards trainees in online lessons so there are chances that they may not be trained with required level of core competent skills.	88.89	11.11	0.00

The teachers agreed in learning outcome that there is difference from what a learner can achieve in face to face. Due to being a little more liberal as a teacher-instructor during online teaching, it is not possible for trainees to develop skills effectively when giving online demonstration lessons.

Further, studies support that there is a direct relationship between the performance and amount of interaction or instructional time (Sternadel, 2021). Which in case, during the closure of schools more time was lost to and the students were not attending lessons as it was during the traditional face to face sessions.

Learning gaps

It is observed from the responses given by teacher-instructors on the three-point rating scale as shown in table 8 that all teacher-instructors have opined that each institution should inspect the units and repeat those units and the experimental tasks as per the institutional requirement, which are more affected during the epidemic time.

Table 8: Teacher instructors' responses on learning gaps (n= 45)

Question	Agree	Neutral	Disagree
Each college should find such learning gaps and should design & conduct separate offline courses for this year corresponding to their curriculum.	91.11	8.89	0.00
The sessions of such a course must be arranged offline at the educational institutes for academic batches affected by the pandemic.	100.00	0.00	0.00

Learning gap should be found out by every college. Trainees of semester - 1 should give priority to much needed practical tasks in the context of their own organization, and they should be effectively planned offline. In the year of this epidemic, a separate bridge course can be organized for the trainees participating in the B. Ed. course and the syllabus can be taught especially by emphasizing the practical work taught online. On the same, Sternadel (2021) found out that students who stayed longer at home did worse in their exams for missing school interaction time than students who attended regularly. Further, Pokhrel & Chhetri (2021) reports the ripple effect of the pandemic was felt in learning loss as students were not able to stay online most the time, and some were not even attending the lesson online.

94% of learners globally were affected by the pandemic and schools' closure by mid-April 2020. The speed to recovery and adapting to changes were not the same at all levels or all institution which resulted into learning gaps (ECLAC-UNESCO, 2020; UN, 2020). Moreover, the gap were intensified by the fact that only 3% of learners were able to access materials prepared by their teachers during school closure (UNICEF & UNESCO, 2021). Over the past two year the changes happened resulted to learning gap, which could be solved by starting spiral curriculum during the offline lesson to cover for the learning loss during the pandemic.

Conclusion

The study findings proved that teaching and practical works, which is practiced in the B. Ed. course online due to Covid-19 epidemic, should be re-teach by including essential points in spiral curriculum to make it more effective. Spiral curriculum proves to be a must in online education. Students can repeat it only where there are theoretical subjects. But when it comes to doing practical work and evaluating it, the trainees during this period should be re-trained effectively as a teacher-instructor and by the college by finding out such units. (Masters, K. Gibbs,T. 2007).

Moreover, Practical training such as micro-teaching and simulation lessons should be re-organized offline by special planning for the trainees, so that these skills can be effectively acquired in the trainees. Units of theoretical subjects, in which students are weak should be enlisted and also be re-taught. Biesta (2019) suggested that he structure of the curriculum for teacher education should be spiral rather than linear-cumulative.

Additionally, the trainees should take the students directly to the school and the teacher-instructor should perform demonstration lesson for the purpose of getting acquainted with the tasks do be done behavior of the teacher in the classroom. Further, Information and training should be provided to the teacher-instructors of the college about how to make online education more effective and what portals and software are available for it.

Conflict of interest

The author declared no conflict of interest in the publication

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