Impact of Covid-19 in Engineering Online Mode Educational System

1Gomathi R D, 2Maheswaran S, 3Radhika S, 4Sathesh S and 5Savitha sri N
1,3Department of English
2,4,5Department of Electronics and Communication Engineering
1,2,3,4Kongu Engineering College, India
1gomathimaheswaran6@gmail.com, 2mmaheswaraneie@gmail.com, 3radhika@kongu.ac.in,
4sathesh808@gmail.com, 5savithasrin@gmail.com

Abstract - The outbreak of COVID-19 had a huge impact on the educational system as it leads to the closure of the educational institutions across globe. This had an impact on both economy and society apart from affecting the students and teachers. The situation became even more worser in the case of the disadvantaged students as it affected not only their education but also lead to problems such as improper nutrition, childcare and also economic problems as many lost their jobs due to the pandemic situation. In order to move on with the situation, UNESCO suggested the educational institutions to takeover virtual platforms as a replacement to the traditional classes in order to reduce the disruption of education. These virtual platforms became a critical lifeline for educational institution as it helps to reduce the transmission of disease. In this paper we could see the ways that the pandemic has transformed the education sector across the world which include Online learning, Unequal access to technology, and educational resources, a wide range of distance learning tools, new methods of assessment with learning management software, online appreciation for teachers and educators and the changing role of parents in education. But there was some gap between educators and learners.

Keywords - COVID-19 19, virtual learning, classes, problem-solving

1. Introduction
The outbreak of COVID-19 19 lead to the closure of various sectors around the world. Let it be a developed or an underdeveloped country no one were prepared to this situation. It affected the world economy and the living of all the people across the globe [1].

The education system was also affected by it as it leads to the closure of all educational institutions. It will forever be remembered in the history of educational sector as a time when the educational institutions around the world were shut down.

The first country to close all the educational institutions was China followed by other countries since January 2020 [2- 4]. Based on a report by UNICEF, about 91% of the world learners were affected by the closure of the educational institutions. However new ways and methods of teaching were being developed as people began to move on with the situation [5].

2. Virtual Learning
Due to the outbreak of COVID-19 19 which lead to the closure of educational systems the UNESCO has suggested the educational institutions to takeover virtual platforms for learning and teaching as an alternative to the traditional face to face teaching. The commonly used online platforms are Google meet, zoom, WebEx, Microsoft teams, YouTube and WhatsApp. Platforms like Google meet; WebEx can be used freely for a specific limit of participants. As the usage of these platforms increases, they began to work towards further up gradation of these platforms and still continue to work towards it. An example of this is the Google meet. In the early stages there were no participants limit and host controls [6]. After upgrading, they limited the participants and included host controls. Apart from this the jam board was included for teaching purposes and also polling options were included. Similar to this many new platforms are being developed specially for educational purposes with new tools that make teaching through online much more interactive with the students [7].

Pros of Virtual Learning
The virtual learning has made it possible to learn anywhere without considering the physical place as a limitation for learning. It is time saving and cost efficient as there is no need of traveling to the virtual environment. Virtual discussions can be made much quicker and with less hesitation. Since it provides an opportunity to record the classes, the students can prerecord them and watch them irrespective of time and clear the doubts rather than wait in order to approach the staff to clear their doubts.

Cons of Virtual Learning
Like a coin with two sides virtual learning has its own disadvantages. As the platform is virtual the interaction is very much reduced in comparison to face to face classes. The students lack their opportunity to attend the classes due to issues such as poor network connectivity, device failure due to electricity shortage, etc. This also leads to improper assessment of students and poor monitoring. It also leads to poor disciplinary activities. Though theoretical education is possible through virtual platforms there arises a need for practical learning which is also necessary for the students. The virtual learning reduced
the questioning answering activities and also correction of mistakes [8].

**Difficulties Faced Due to Virtual Learning**

At the beginning of the virtual education difficulties were faced both by students as well as teachers to move on with it since it was a new beginning. The main challenge faced by the teachers was to make the students engaged with the classes and also understand the concepts. It was a difficult task to make the sessions interactive. Apart from this, there were a lot of technical issues faced by both teachers as well as the students [9]. This includes lack of proper device such as laptops or mobile phones, network problems in remote areas, etc. They also missed classes due to electricity failure and several similar reasons. Apart from these students were also distracted due to home environment, health problems, etc. as shown in Figure 1, though virtual learning has helped the students to continue their education it does not provide a complete solution to this problem since practical knowledge is needed when working with equipment and performing experiments [10].

**Fig. 1: Challenges due to virtual learning**

3. **Methodology**

The study was the survey which was carried out with 350 students from different disciplines of engineering. The students selected for the research were from various categories of streams at different level of years. Certain questions were posed to them to get the responses for the reality of virtual classrooms. These were asked to determine the opinions of students at multi-levels in terms of online mode of teaching and learning. There were 10 questions in regard with attending the classes, benefits they have, usefulness of the materials, how far the classes help them in problem-solving, etc. The responses of the students were analyzed and the findings were presented in the form of charts.

4. **Results and Discussions**

**How you are attending the class?**

![Fig. 2: How you are attending the class?](image)

From Figure 2, it is clear that the most of the students’ login themselves and after that they use to do other works. Only 20% of the students are sincere in attending the classes and it is explicit that 4% of the students create duplicate ids with the help of their friends to outsmart their teachers.

**How helpful was the class material provided to you?**

![Fig. 3: How helpful was the class material provided to you?](image)

From Figure 3, it is shown that 61% of the students find the materials that are useful for them to study during the exams. Even 29% of students show strong agreement in accepting the materials for use. Only 1% of students show dissatisfaction for the class materials sent to them.

**How satisfied are you with the practical and theoretical knowledge provided online classes?**

![Fig. 4: How satisfied are you with the practical and theoretical knowledge provided online classes?](image)

In Figure 4, it is obvious that 44% of students are satisfied with the practical and theoretical knowledge provided through online classes. 22% of students show dissatisfaction regarding knowledge sharing in the classes online. 9% of students are neutral and 16% of them recorded satisfaction for the practical and theoretical knowledge through online mode.

**There is a professional development strategy towards online training?**

![Fig. 5: There is a professional development strategy towards online training?](image)

From Figure 5, it is registered that 42% of students are not satisfactory in terms of professional development via online training. 22% of students show strong disagreement for their professional growth. On the contrary, 5% of students record strong satisfaction for their professional enhancement.
At what level you are satisfied with your involvement and commitment in solving the problems?

From Figure 6, it is registered that 26% of students are not satisfied in terms of involvement and commitment via online training. 12% of students are satisfied by the online practice by which they find solutions for problems. 43% of students show strong disagreement for their involving and committing themselves for problem solving. On the contrary, 8% of students record strong satisfaction for the online classes which satisfy them.

Do you satisfy with availability of e-resources?

From Figure 7, it is very clear that the availability of e-resources shows high satisfaction among the students with the percentage of 76 and on the contrary, it is only 24% of students who get satisfaction for the e-resources.

Do you satisfy your teachers’ assistance?

From Figure 8, it is very clear that the teachers’ assistance shows high satisfaction among the students with the percentage of 68 and on the contrary, it is only 32% of students who get satisfaction for the assistance given by the teachers.

Do you satisfy with online assignment submission?

From Figure 9, it is very clear that the online assignment submission shows high satisfaction among the students with the percentage of 55 and on the contrary, it is only 45% of students who get satisfaction with the online submission.

How far the online mode helps you to groom your professional career?

From Figure 10, it is clear that 24% of students agree that the online classes are much less effective and help them to groom themselves for career growth. 32% of students record that the classes they have during the online mode are somewhat less effective. 21% of students say it is equally effective. It is only 17% of students say that the classes are somewhat more effective for grooming themselves. 6% of students enroll that the online mode is somewhat more effective.

How do you rank the skill building and knowledge level?

From Figure 11, it is clear that 14% of students rank that the skill building and the knowledge level is much less effective. 24% of students record that the skill building they have during the online classes are somewhat less effective. 20% of students say it is equally effective. It is only 29% of students say that the levels somewhat more effective. 13% of students enroll that the level of skill building shows somewhat more effective for the classes online.
How was your impact on interaction level?

From Figure 12, it is clear that 52% of students agree that the interaction level is much less effective. 29% of students record that the interactions they have during the online classes are somewhat less effective. 11% of students say it is equally effective. It is only 6% of students say that the classes are somewhat more effective. 2% of students enroll that the level of interactions shows somewhat more effective for the classes online.

The learning needs are meet out individually through online training?

From Figure 13, it is clear that 41% of students agree that the learning needs are meet out individually through online training. 27% of students record that they are somewhat less effective due to online mode of training. 18% of students say that the learning needs are equally effective. It is only 3% of students say that the training is much more effective. 11% of students register that the learning practices show somewhat more effective for the classes online.

5. Conclusion

The Virtual platforms with the help of the developing technology enables the learners to access materials which are beyond the textbooks and provides new opportunities for learning. In this paper we could see the ways that the pandemic has transformed the education sector across the world which include Online learning, Unequal access to technology, and educational resources, a wide range of distance learning tools, new methods of assessment with learning management software, online appreciation for teachers and educators and the changing role of parents in education. But there was some gap between educators and learners. From the analysis, it was clear that the most of the students’ login themselves and after that they use to do other works. Only 20% of the students are sincere in attending the classes and it is explicit that 4% of the students create duplicate ids with the help of their friends to outsmart their teachers. About 43% of students show strong disagreement for their involving and committing themselves for problem solving. On the contrary, 8% of students record strong satisfaction for the online classes which satisfy them. It is clear that 52% of students agree that the interaction level is much less effective. From the various analysis, the over view of this online education was strong disagreement in learning point of view.

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