


Online Synchronous Teaching During a Pandemic: Investigation of Technology Efficacy and College Student Responses

Pallavi Sood, Chitkara Business School, Chitkara University, Punjab, India

Kulwant Kumar Sharma, Chitkara Business School, Chitkara University, Punjab, India

Rajeev Kumar, Chitkara University Institute of Engineering and Technology, Chitkara University, Punjab, India

 <https://orcid.org/0000-0001-7189-3836>

ABSTRACT

As the novel coronavirus (COVID-19) spread rapidly across the globe, most educational institutions tried to address major challenges of engaging students in a productive way and disseminating knowledge through online learning. Given this consideration, the present study qualitatively explores the observations and experiences of a private university and giant strides taken by the institution in adapting and delivering value to all the stakeholders through educational transformation during the pandemic. The data was collected using observations and in-depth interviews. The findings of the study revealed that the university went through certain structural changes and modified teaching pedagogy for virtual delivery like providing support and training to the faculty before shifting completely to online mode and delivering the sessions online in both synchronous and asynchronous mode. The results of the study are likely to help transform and address the major challenges of engaging students in a productive way and disseminating knowledge through online learning during a pandemic.

KEYWORDS

Asynchronous, Educational Transformation, Online Education, Pandemic, Pedagogy, Synchronous

INTRODUCTION

During the early 20th century, a pandemic of Influenza engulfed the globe costing millions of people their lives. Till Dec 2019, no one ever imagined that a similar pandemic flu was going to visit the global comity of nations again and take a toll on human lives at similar scale. As the novel Coronavirus (COVID-19) spread rapidly across the globe, the countries and their economies were left with no other choice but to lockdown all the sectors. Suffering has been in equal measure for both the developed and developing countries. Amongst all this alarming muddle of economics, finance, sustenance and survival paranoia, people all across the world suffered colossally. Countless people lost their jobs and had no choice but to depend on social handouts and government aid to get basic necessities each day. There were some heartbreaking visuals of people marching on foot in India, for a never-ending journey to reach their homes in faraway states. Many flew out of the countries where they were working and headed back home, only to find themselves in a dire strait. Apart from the sectors like

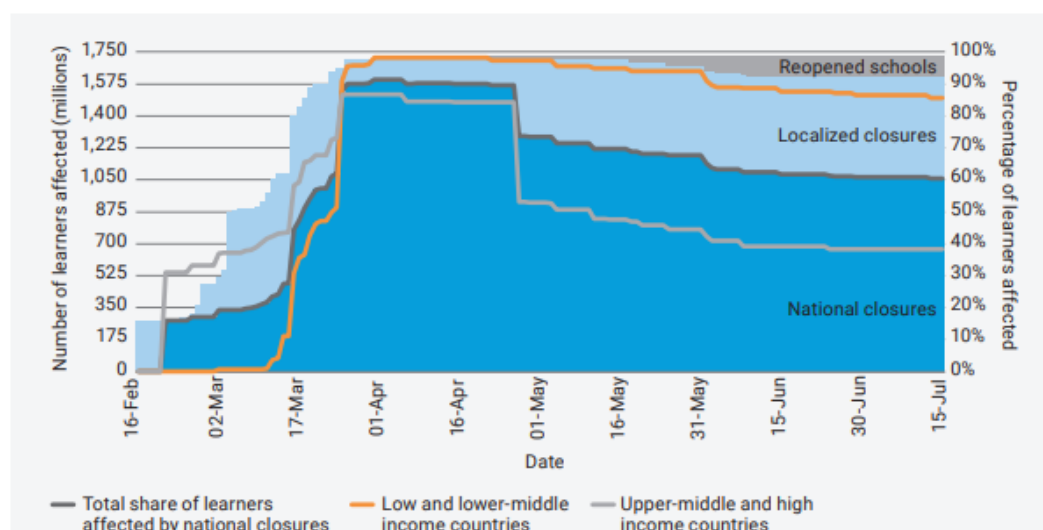
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finance, industry, agriculture and services, corona virus steadily swept its way around the education sector and its impact was more than visible all across the globe (Economic Times, July 21st2020).

As per the UN Report (August 2020), the world had nearly 250 million children out of school and as many as 800 million adult illiterates even before the pandemic broke on the scene. The present disruption in education system at global level due to COVID-19 pandemic has been considered as the largest in history. It has affected nearly 1.6 billion students in over 190 countries all around the globe. The report further notices that nearly 94% of the students' population has been affected due to schools and other educational centers' closure in the last six months. Adverse impact has been more severe in low and lower middle-income countries, affecting nearly 99% of the student population. The UN Report urged all countries to prevent this learning crisis.

Figure 1. Covid 19's Impact on Global Education



Source: United Nations Report on 'Education during Covid 19 and beyond', August 2020.

The above figure shows the number of learners affected by national closures of educational institutions globally. The figure indicates that more than 90 percent of the learners in both low and high income countries had to stay out of educational institutions due to closures.

It was like any other day for everyone when suddenly there was a newsflash all over the world media revealing a strange communicable disease outbreak from Wuhan in China. The first case of the virus can be traced back to November 17, 2019 in China's Hubei province, which eventually became an epicenter before it rapidly spread abroad (The Economic Times, December 3, 2020).

At the beginning of February 2020, only schools and universities in China and a few other affected countries were closed down due to the virus transmission. However, by mid March 2020, almost all the countries across the globe implemented or announced that schools and universities must be closed. As of now, the crisis and unparalleled education disruption is far from over. Almost about 100 countries have yet to announce a date for schools to reopen and across the world, governments, unions, parents and children are grappling with when and how to approach the next phase (United Nations Report on 'Education during Covid 19 and beyond', August 2020). It also appeared that the educational institutions would be the last ones to open, and that too if only the transmission can be arrested or transmission curve is fully flattened. As the UN report (2020) states, the close down of educational institutes affected millions of learners across the world and forced the education sector

to look for and pursue various alternatives. As a result, most educational institutions have addressed major challenges of engaging students in a productive way and disseminating knowledge through online learning.

The first case in India was confirmed on 30 January 2020 in the state of Kerala, when a university student from Wuhan, China travelled back. As the number of confirmed COVID-19 positive cases closed to 500, the Government of India imposed a curfew on 22 March. Following this, on 24th March, a nationwide lockdown for 21 days was imposed to break the transmission chain. Same was further extended till the end of May, but with some relaxations. With the ongoing turmoil, all the sectors were badly hit as people had no choice but to shut down every activity and stay at their homes. Schools, colleges and universities closed down by middle of March and students, faculty and other staff were also locked in their homes (The Hindu, 31st March, 2020).

Education is likely to transform when stakeholders synthesize information and incorporate various inquiries (Sun, Chan & Chen, 2016). But, teaching-learning process during the times of cataclysmic disruption requires creative and flexible thinking, about how educators can support students in achieving the learning outcomes of the course despite the disruption of regular classroom meetings and schedules. Educators must ensure that such policies are created to encourage students to enhance their imagination, creativity, self awareness and ability of analysis (Hodges, Moore, Lockee, Trust & Bond, 2020).

The study discusses one such transformative journey of a private university in North India, which emerged as an example to other educational institutions. The research highlights the giant strides taken by the institution in adapting and delivering value to all the stakeholders. The prime aim was to continue uninterrupted education delivery by adopting online learning and successfully delivering knowledge and value to the students.

About the University

Chitkara University is situated in the state of Punjab, in the northern region of India. The precursor of the University was an Engineering institute founded in 2002, while it was recognized as private university through a legislative bill of Punjab Vidhan Sabha in 2010. The pioneers and edupreneurs are Dr. Ashok Chitkara, present Chancellor and Dr. Madhu Chitkara, the Pro-Chancellor of the University. Both are passionate academicians, role models and teachers to their core. Since its inception, the university has defined itself as 'Unique' in terms of its outlook towards teaching and learning, and is considered as one of the best in its league. This has been acknowledged by peers as well various rating agencies in the country. Within a decade, most of university colleges and schools were ranked in top 50 in the country. The university has an impressive infrastructure, extracurricular facilities and adequate residential accommodations for both Indian and international students, having tie-ups with more than 150 prestigious global educational institutions.

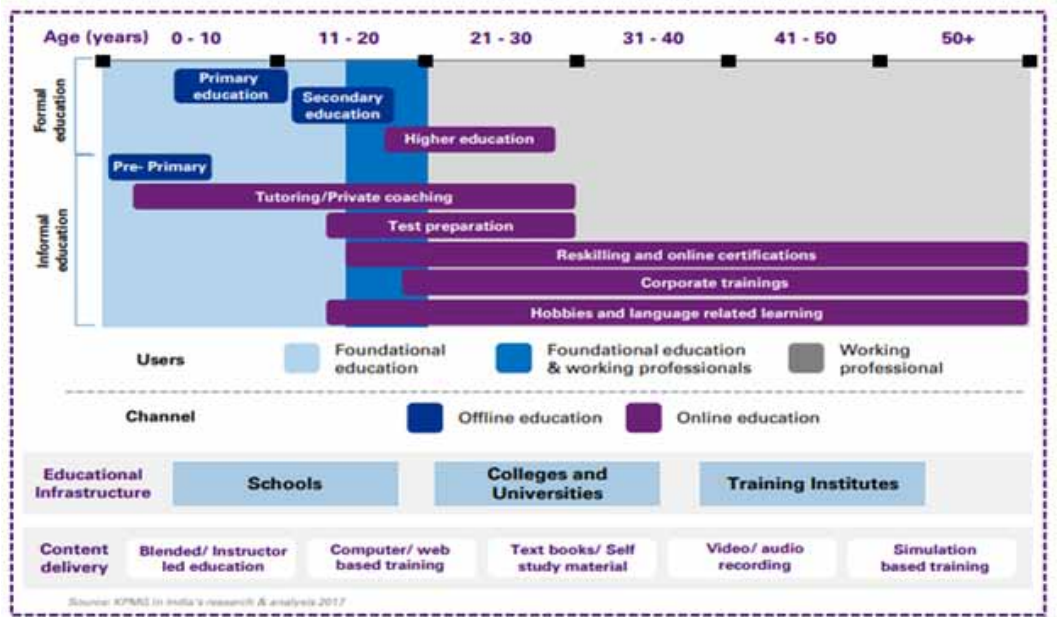
The university became the single university from North India to feature in the list of the Times Higher Education Impact Rankings 2020 released by Time Higher Education on 22nd April 2020 and became India's first university to be recognized worldwide for E-Learning Excellence for Academic Digitization by Quarcquerelli Symonds Rankings (Business World, May 15, 2020). The achievements are very impressive for a young university, determined to skip a few generations of evolution and launch itself fully into data and artificial intelligence driven global connect. The discussion in this study highlights the university's successful journey towards a glorious destination.

The Online Education Landscape

The online education providers play a pivotal role in the higher education system. Growth of distance education in India can be traced back to opening of the Indira Gandhi National Open University established in 1985, which offered students degrees widely accepted in the job market. Since then, the online education has expanded both in terms of scope and size (Sharma & Deppeler, 2005). Currently, the online education system in India has a combination of full time dedicated and popular

online education players like the Khan Academy, Coursera, Udemy, Unacademy and many others as well as offline institutions with online presence like various universities and colleges offering distance education courses (KPMG in India's research and analysis, 2019).

Figure 2. A Brief overview of Indian Education System



Source: Online education in India, KPMG 2017

The above figure is indicative of the fact that online education has a massive presence in terms of user base and variety of learning modes such as blended education, web based training, etc. in higher education. Also, the adoption of online education is driven across various age groups largely to enhance their chances of employability. Still, there is a lot more to be discussed since during the spread of pandemic, many traditional educators also added on to the online teaching industry in order to keep up with the pace. It also cannot be denied that these institutions were short on both time and resources to plan and implement online education models(Hodges, Moore, Lockee, Trust & Bond, 2020).

LITERATURE REVIEW

To understand a phenomenon completely, it is imperative to study its detailed literature. Its purpose is to review recent progress in a particular topic, summarizing the current state of knowledge as well as define the scope for future research (Boote & Beile, 2005). For this study, extensive review was undertaken in order to gain insights into various perspectives on online learning.

Wallace (2003) stated that in online delivery, the importance of establishing an interactive relationship was of utmost significance. She contended that such interactions resulted in good learning results. In creating effective pedagogy for online learning, Bailey and Card (2009) stressed upon the carefully crafting learning expectations, outcomes and objectives. The authors shared eight pedagogy practices for effective learning: Fostering relationships; Student engagement; Timeliness;

Communication; Organization; Technology; Flexibility; and Expectations (p.154). They also expressed that empathy; passion and willingness to help students are the crucial factors to succeed. It is highly recommended that the instructors and students must be attentive and responsive. (Bailey & Card, 2009, p.154).

Rao and Tanners (2011) considered adapting to strategies for achieving objectives of a course to be delivered online. It should be well-organized and students should be given all course materials at the starting. Flexibility was another crucial element for effective online teaching. Since technology isn't always reliable, prior planning is needed to cope with system delays, software updates, email glitches, etc. Keengwe & Kidd (2010) found, that if the course design includes videos and audios, it can make required text more interesting for the students. In a nutshell, it is advised that online instructors must have clear and structured setting up and management of course design and content, they must obtain and utilize the available resources effectively and should chart the sequence of activities having structured timelines.

In order to understand a phenomenon completely, it is imperative to explore it from different perspectives. In this case, two significant stakeholder perspectives, the learners' perspective and the teachers' perspective are considered. Also, before exploring any further, it is important to look back at some studies to widen the research scope and fruitfulness. Stating of technological advancement, Gillett-Swan (2017) stated that "Teaching with the help of technology is not a one size fits all approach." (p. 119). Apart from technology usage, online teaching is highly affected by time management and the curriculum being taught. Though incorporation of technology provides additional factors for constructive learning experiences, it is still worth discussion if only technology can enhance learning (Kirkwood & Price, 2014, p. 6). However, in creating individually tailored differentiated instructions for each learner within and across each delivery, additional workload pressures are definitely expected in responding reactively to the individual learning needs of students.

The creativity and engagement methods can particularly be highlighted in group tasks. The challenges are posed due to generalized pedagogical assumptions in the online environment (Graham & Misanchuk, 2004). The research concluded that, it would be wrong to assume that students will both know and be able to work in groups regardless of mode. Rather, this would leave the teacher with a group of confused learners. Also, on top of everything the technological challenges of learning a new and improved web application, attending never ending webinars, family expectations (because the person is at home after all!) and constantly being glued to the laptop causes a great deal of stress. Work from home is still not considered to be satisfactory by many teaching organizations and to justify what they are paying to the employee, a load of seminars, records, display of pictures and endless parade of instant mails and messages follow over and above the regular teaching sessions (Fry, Ketteridge & Marshall, 2009).

For learners, the online environment presents added challenges. One such concept is the 'isolated learner'. Due to their age and social isolation, many students feel out of the loop and alienated (Mallman & Lee, 2017). The barriers to participation that students may experience are particularly evident in student presentations and assessments (Graham & Misanchuk, 2004; Jaques & Salmon, 2007). A few personal issues and barriers may be of hindrance such as anxiety; being out of comfort zone and difficulty in peer interaction. Despite the best intentions to provide beneficial learning experiences, faculty may feel apprehensive as they themselves may be still learning to use some of the platforms (Jaques & Salmon, 2007; Little-Wiles & Naimi, 2011; Rucker & Downey, 2016). This can leave learners with varying levels of proficiency of IT usage and particularly due to the instant feeling that they are on their own when it comes to the online learning environment through Learning Management Systems (LMS).

Emergency Remote Learning versus Online Learning

Well-planned online learning structure offers a completely different learning experience than one designed in response to a crisis. The threat of COVID-19 put on some unique challenges mainly for

educational institutions which earlier were not very well engaged in online teaching-learning mode. All of a sudden, students, faculty, and staff were asked to do extraordinary things opting alienated ways of course delivery and learning. Typically, the planning, development and preparation time for a fully online university course is considered to be six to nine months (Lockee, Moore & Burton, 2001). In a situation of crisis, it would have been unfair to expect the same level of support in such a narrow preparation window.

As much as the organization tries to find a clever solution, the stakeholders would find this process stressful (Hodges, Moore, Lockee, Trust & Bond, 2020). Anyhow, the institutions can learn from various similar situations where a shift to online learning played a prominent role. The use of radio and DVDs in Afghanistan to provide access to education in times of violence and conflict could be regarded as an excellent example. It becomes apparent that educational planning in crises requires creative problem solving. Quick thinking and with a little flexibility, adaptability and motivation could end up doing wonders creating an efficient, effective and sustainable education ecosystem in crisis (Davies & Bentrovato, 2011).

Though there are vigorous debates on the differences between online and offline classroom teaching, during this time no other alternative was applicable but to opt for online teaching. Within a limited time span and resources a few educational universities quickly adapted to the practice. Chitkara University set one such example by not only initiating the change timely, but implementing it effectively. The steps taken by the university and steps taken to facilitate student learning throughout the imposed lockdown are discussed in detail.

The literature sums up that effective online delivery definitely depends on online teaching practices including a well-designed course content, motivated interaction between the instructor and learners and optimum usage of technological advantage as well as application and usage of Learning Management Systems by the educational institutions. Therefore, the present case is focused on the structural measures taken by the university to facilitate student learning through LMS during the lockdown period caused by Covid 19 pandemic, the best online teaching practices followed university wide, and the resultant student satisfaction and learning. The study might be useful to other educational institutions, online instructors and innovators considering the fact that online education is the need of the hour and a new dynamic to novice and veteran faculty, students and institutions.

Aim of the Study

The present study investigates the experiences of university students and faculty with web-based teaching and learning approaches, and its impact on improving the overall academic experience to overcome disruption caused due to the pandemic. This study also identified which of the alternative structural measures were taken and which online teaching practices were influential in improving the level of academic experience among participants. The framework provides significant guidelines for the necessary course of action to be taken by educational institutions during a contingency citing some of the best practices in online teaching related to course design, delivery and assessment with the help of Learning Management System.

METHODOLOGY

Data Collection

The data for the study was collected with the help of both Face to Face and Telephonic interviews conducted by the author between April 2020 and July 2020. Post Covid 19, mixed interviews approach was considered particularly suitable for the present research since it permitted the respondents to completely articulate their own experiences from their homes via telephones and effectively convey their perceptions on the same (Ross & Squires, 2011).

Table 1. Demographic characteristics of the respondents

S.No.	Stakeholder Profile	Gender	Age	Mode of Interview
1	Student	Male	19	Telephonic
2	Faculty	Male	36	Telephonic
3	Faculty	Female	39	Telephonic
4	Faculty	Male	48	Face to Face
5	Faculty	Male	52	Telephonic
6	Student	Male	20	Telephonic
7	Student	Female	21	Telephonic
8	Faculty	Female	32	Telephonic
9	Student	Male	19	Telephonic
10	Student	Male	20	Telephonic
11	Faculty	Female	37	Face to Face
12	Student	Female	21	Telephonic
13	Faculty	Male	42	Telephonic
14	Faculty	Male	36	Telephonic
15	Student	Male	22	Telephonic
16	Student	Female	21	Telephonic
17	Student	Male	21	Telephonic
18	Faculty	Male	39	Face to Face
19	Faculty	Male	37	Face to Face
20	Faculty	Female	46	Telephonic

Source: Author's Compilation

Participants

The participants of the study were selected by using purposive sampling technique. The respondents included faculty and students of Chitkara University. Out of 27 people approached, 7 were unable to communicate due to connectivity issues. The confidentiality of the responses was assured to the interviewees. A total of 20 semi-structured interviews were conducted. The duration of the interviews ranged between 18 to 30 minutes.

Instrument Used

In the data analysis stage, two qualitative softwares were used to transcribe and analyze the data. The first software used was NVivo Transcription, which was used to transcribe the recorded interviews. The software assisted in converting the audio files into MS-Word files. The other software was NVivo 12 which was utilized in the analysis of the transcribed data. NVivo is an information management tool especially useful for the qualitative research. The transcribed files were imported to NVivo and various analysis techniques namely, Mind Map, Word cloud, Word Frequency, Text Search Query, and Word tree were applied to the collected data.

A word cloud is a collection, or cluster, of words depicted in different sizes. The bigger and bolder the word appears, the more often it's mentioned within a given dataset. At the beginning of research, a mind map is used to explore expectations or initial theories. Word Frequency queries list the most frequently occurring words or concepts in the data. Text search queries find all occurrences

of a word, phrase or concept in the data set. This is a commonly used feature in NVivo that enables finding every instance of particular alphanumeric **text** strings in a project. A **word tree** is used for data visualization. Tree maps can help you to explore your coding or make comparisons based on attribute values.

RESULTS AND DISCUSSION

Before proceeding with data analysis, a mind map was created using QSRNvivo12, containing the details of variables around which the collected data shall be interpreted. A mind map reflects thoughts about a topic and is created at the beginning of the project to explore researcher's expectations.

Figure 3. Mind Map reflecting the core areas of the study



Source: QSRNvivo12 output

1. Structural Measures taken by the University:

This component would reflect the structural changes by the university during the pandemic to ensure smooth transition from offline mode to online mode for both faculty and students. The measures opted by the university to support online teaching and assessment will be listed and discussed in the end.

2. Online Teaching Practices:

This section provides insight to the online teaching practices followed by the faculty during the course of lockdown. It focuses on the mode and duration of course delivery, course assessment, establishing effective communication with the students and optimum utilization of available resources in the best ways possible.

The analysis and interpretation of the data using NVivo12 is depicted through figures below. The data was collected with the help of in-depth interviews of faculties and students of the university. The findings listed at the end, are classified under core areas of the study namely; ‘Structural Measures taken by the University’ and ‘Online Teaching Practices’

Figure 4. Word Cloud presenting the most frequently used words by the participants



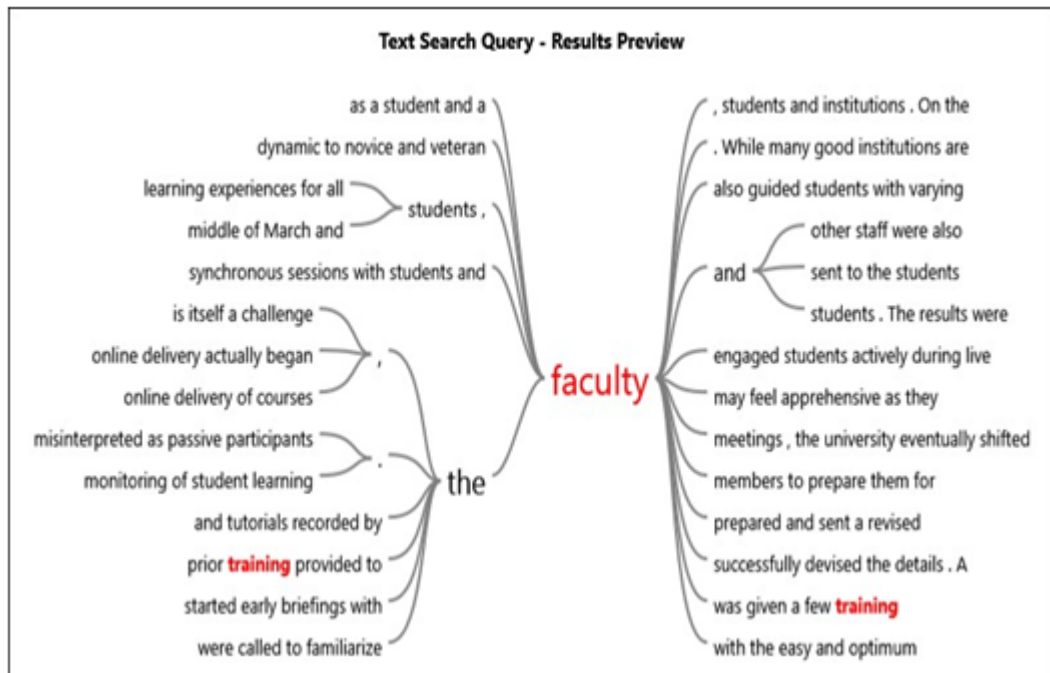
Source: QSRNvivo12 output

This helped in capturing the overall view of responses in a single sight. Figure 4 shows the most common words uttered by respondents during interviews. It can be seen that the respondents focused upon words and phrases like, 'Online', 'Learning', 'Students', 'Teaching', 'Faculty', 'Training', 'Technology', etc. Online Teaching Practices and their impact on student learning is clearly at the center. The framework provides significant view of the necessary course of action in online teaching related to course design, delivery and assessment with the help of technology.

Text Search Queries:

Text search queries aim at search for words or phrases in the data. It includes exploration of the usage of words while the researcher derives the context and meaning out of it. The figure below contains text search query conducted for the term 'Faculty'.

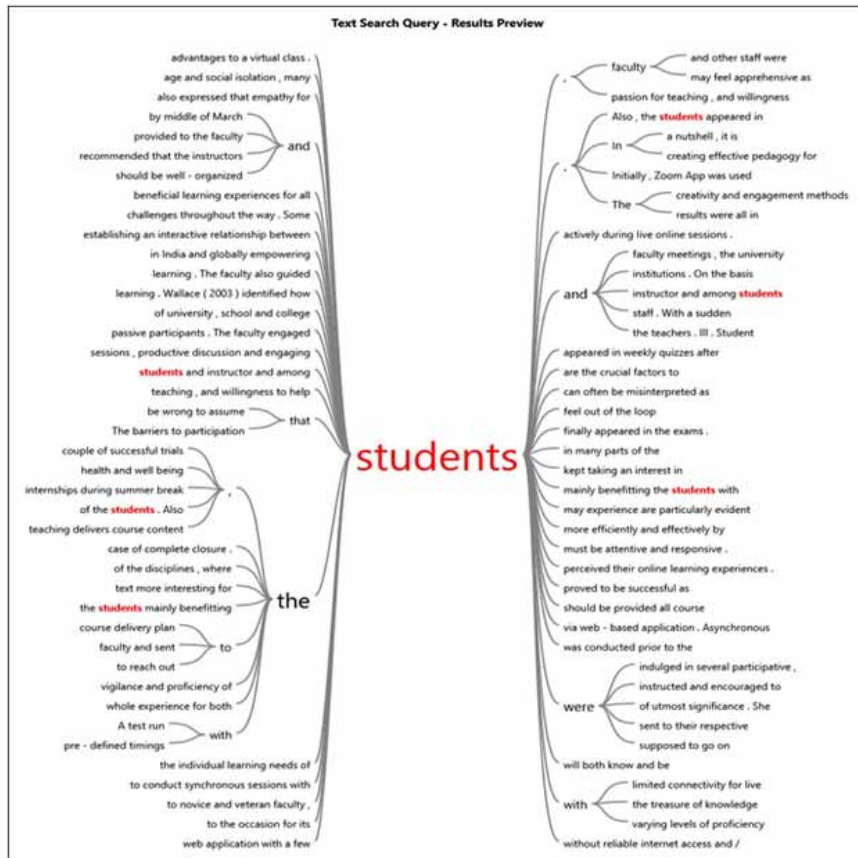
Figure 5. Text Search Query for 'Faculty'



Source: QSRNvivo12 output

The above figure shows the word tree which was generated by text search query for the term 'Faculty'. There are several associations which can be easily drawn out of this query such as 'prior training provided to the faculty', 'faculty engaged students actively', 'the faculty successfully devised the detailed instructions for students', 'monitoring of student learning by the faculty', 'the faculty prepared and sent a revised course plan to the students', etc.

Figure 6. Text Search Query 'Students'

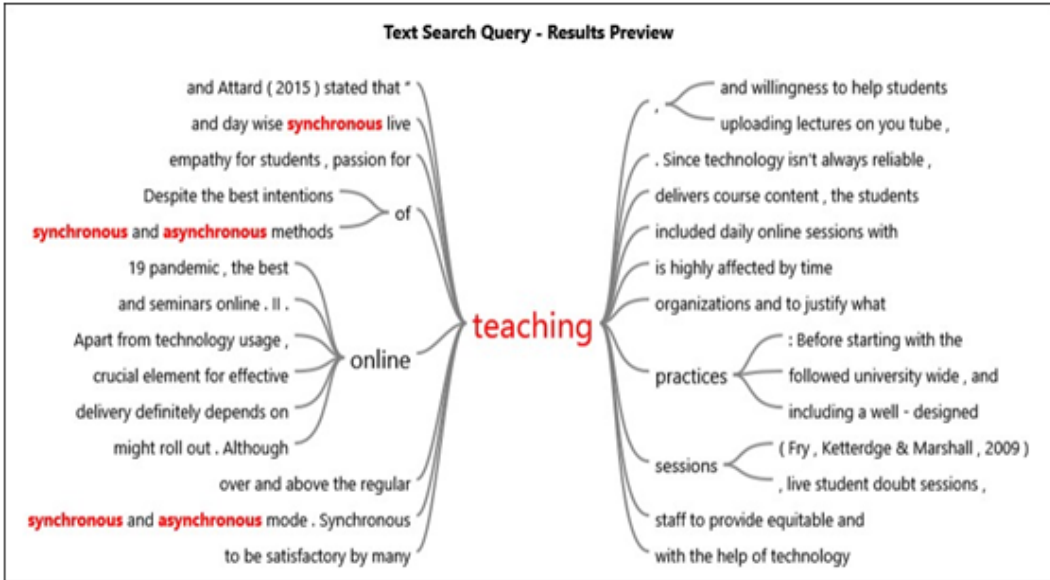


Source: QSRNvivo12 output

The students being at the centre to the preparation and delivery outcomes, many signification inferences can be drawn from the above figure. 'The individual learning needs of the students are the crucial factor in online learning', in synchronous sessions, 'the students were actively engaged', 'the students mainly benefitting from web based applications', 'health and well being of the students being monitored', 'challenging to engage students with varying levels of proficiency', challenges of unreliable internet connection', 'establishing interactive relationships with the students', 'the faculty engaged students actively during synchronous sessions'.

While it is significant to focus on the learning process and outcomes, one absolutely cannot ignore the challenges that come along the way at both ends as a student and a faculty. While many good institutions are using both synchronous and asynchronous methods of teaching, uploading lectures on you tube, live sessions on platforms like Google Teams, Microsoft Teams, Zoom Classrooms or using online resources of MOOC such as 'Swayam' etc., still at times, the system might roll out. Although online teaching delivers course content, the students can often be misinterpreted as passive participants. The faculty engaged students actively during live online sessions. The communication was kept two-way throughout and several videos and visuals were used in between the session to break monotony.

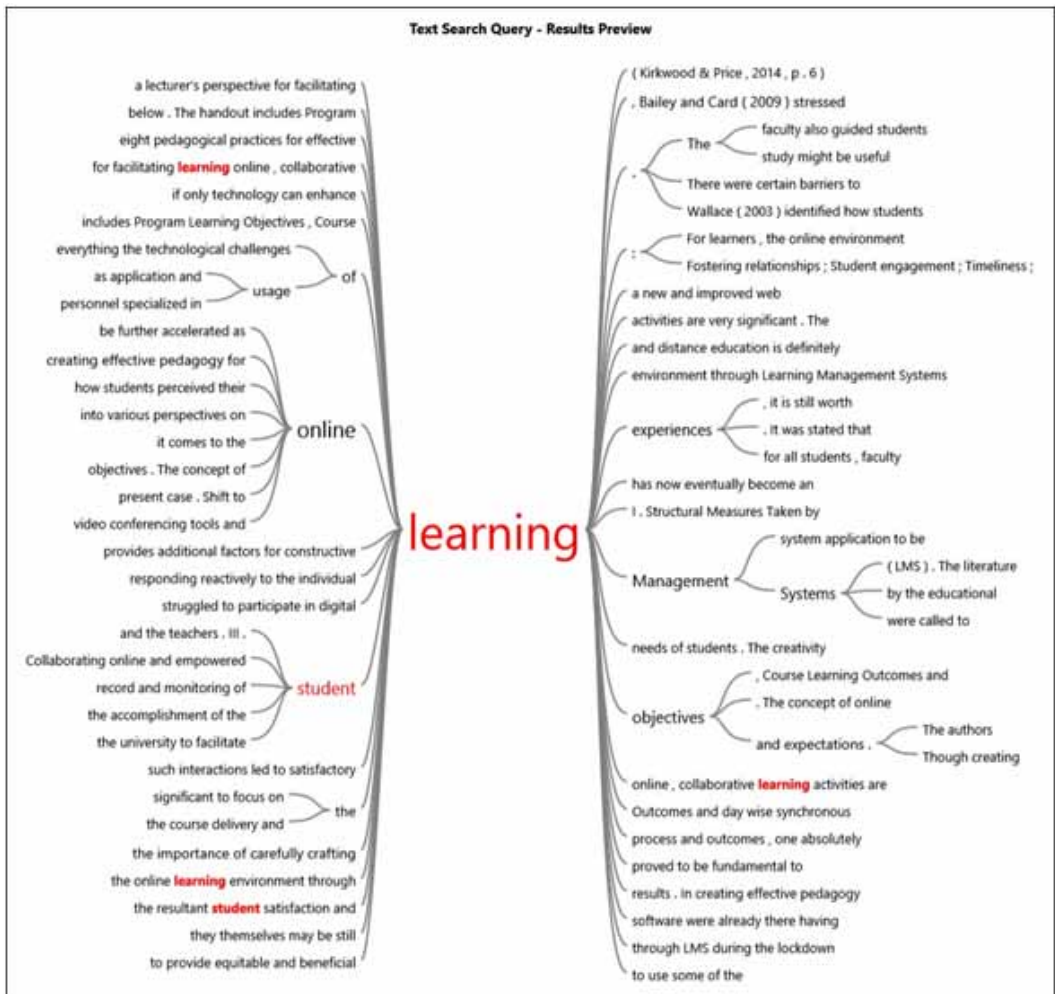
Figure 7. Text Search Query 'Teaching'



Source: QSRNvivo12 output

The above text query for 'Teaching' depicts and highlights various things such as 'day wise synchronous live sessions', 'synchronous and asynchronous methods to deliver course content', 'online students' doubt sessions', 'uploading lectures on You Tube', 'online teaching is effected by time and technology', etc. The sessions were delivered online in both synchronous and asynchronous mode. Synchronous teaching included daily online sessions with pre-defined timings with the students via web-based application. Asynchronous delivery was mostly through lecture videos and tutorials recorded by the faculty and sent to the students mainly benefitting the students with limited connectivity for live sessions in the remote areas.

Figure 8. Text Search Query 'Learning'



Source: QSRNvivo12

The above figure points out towards many noteworthy conclusions such as 'Collaborative and online empowered learning practices proved to be successful', 'Online Learning using LMS', 'Video conferencing tools and online learning software was used', 'Daily and Weekly online assessments were generated', 'For learners, the online environment served as a useful and novel experience', 'Empowering online learning through Learning Management Systems', 'The resultant student satisfaction proved to be fundamental', etc.

Overview

1. Structural Measures taken by the University:

A week before formal announcement of the lockdown, the university management proactively, started planning for the contingency. Starting with a series of meetings and brainstorming sessions with senior management and the departmental heads, a carefully crafted roadmap was set to be

implemented in case of complete closure. The students were sent to their respective homes a week before the lockdown and the departmental heads started early briefings with the faculty members to prepare them for what was coming their way. It was decided that the sessions will be delivered online in both synchronous and asynchronous mode.

Synchronous teaching included daily online sessions with pre-defined timings with the students via web-based application. Asynchronous delivery was mostly through lecture videos and tutorials recorded by the faculty and sent to the students mainly benefitting the students with limited connectivity for live sessions in the remote areas.

Before online delivery actually began, the faculty was given a few training sessions for a couple of days on the course delivery and the learning management system application to be used for online sessions. A few personnel specialized in usage of Learning Management Systems were called to familiarize the faculty with the easy and optimum usage of the web based platform. After undergoing a formal training, the faculty successfully conducted a test run on the web application with a few students. Initially, Zoom App was used to conduct synchronous sessions with students and faculty meetings, the university eventually shifted to Microsoft Teams Application with prior training provided to the faculty and students. The results were all in favor.

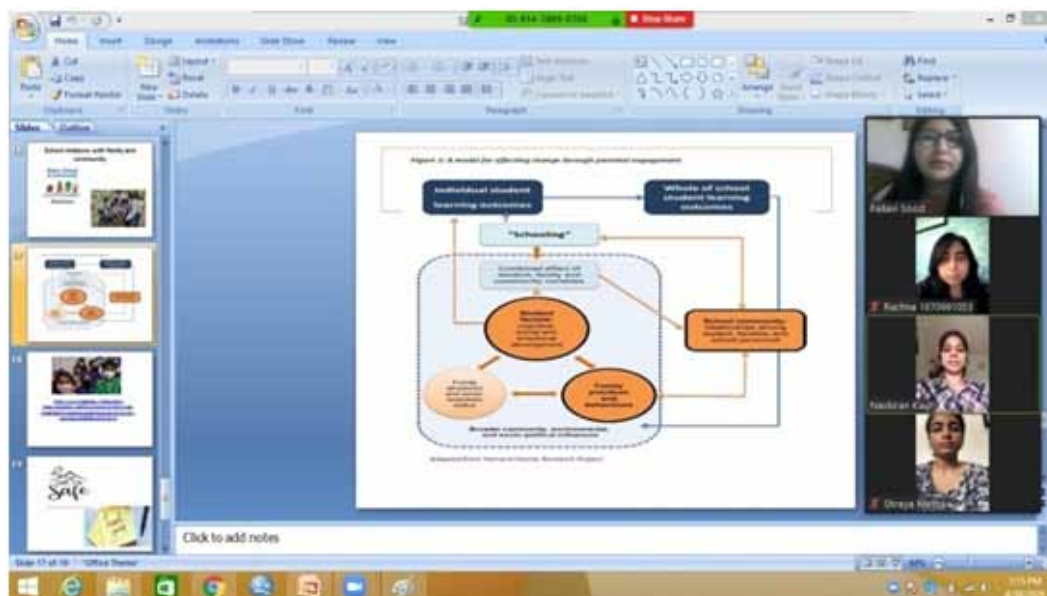
2. Online Teaching Practices:

Before starting with the online delivery of courses, the faculty prepared and sent a revised course delivery plan to the students. In creating effective pedagogy for online learning, Bailey and Card (2009) stressed upon the importance of carefully crafting learning objectives and expectations. Though creating an effective course handout in a short period of time is itself a challenge, the faculty successfully devised the details. The handout includes Program Learning Objectives, Course Learning Outcomes and day wise synchronous live teaching sessions, live student doubt sessions, web links and pre recorded video lectures under asynchronous delivery, reference material and books as well as daily and weekly online assessments.

By the end of the course, the student assessments were also smoothly conducted through specialized web based applications. The university used assessment applications like '*Moodle*' and '*My Anatomy*' to conduct student assessments at the end of the course. A test run with the students was conducted prior to the final assessment to ensure smooth conduct. After a couple of successful trials, the students finally appeared in the exams.

During the summer break, in few of the disciplines, where the students were supposed to go on their internships, the students were instructed and encouraged to enroll in online courses and diplomas offered by various platforms like 'Swayam', 'Coursera', 'Unacademy', 'LinkedIn' etc. Also, the faculty was provided with several workshops and training sessions on novel web based skills on conducting live sessions to taking student assessments during the break. Apart from this, a large number of faculties attended and delivered various expert talks and seminars online.

Figure 9. Image of Synchronous Virtual Live Session



Source: Chitkara University, Punjab

Online quizzes were conducted daily after the delivery of daily course content to check the proficiency of the students. Also, the students appeared in weekly quizzes after coverage of an entire unit. This helped in maintaining a continuous record and monitoring of student learning. The faculty also guided students with varying levels of proficiency of IT usage whenever necessary so that the student does not feel left out or lost. Being considerate of the students' mental health and well being, the students were indulged in several participative, fun and motivational activities from time to time. Throughout the course, the faculties were vigilant and receptive of students' concerns and doubts which added on to the fruitfulness of the whole experience for both the students and the teachers.

Even before COVID-19, there was already high growth and adoption in education technology, with global edtech investments reaching US\$18.66 billion in 2019 and the overall market for online education projected to reach \$350 Billion by 2025 (World Economic Forum, 2020). The language apps, virtual tutoring, video conferencing tools and online learning software were already there having a fair share of market. Simultaneously, it cannot be denied that there has been a significant surge in their usage due to recent situation.

The circumstances were not particularly challenging for established online education platforms but greatly affected the bulk proportion of university, school and college students in many parts of the globe. While some educational institutions were still in turmoil, there is no denying that Chitkara University definitely rose to the occasion for its students and staff. With a sudden and successful shift from traditional mode to going completely online, the university proved that not only it can effectively sustain the interests of all its stakeholders but also emerged as a leader in education sector in India and globally empowering students with the treasure of knowledge during the difficult times.

After analyzing the data, the core areas in the above figure emerged to be extremely significant and were frequently highlighted in the text. The integration of information technology in education will be further accelerated as online learning has now eventually become an integral component the education sector, enabling educational institutions to reach out to the students more efficiently and effectively by meticulous planning, implementation and most importantly by following a proactive approach, especially during contingent situations like a pandemic. Online teaching, Assessments,

Table 2. Overview of structural measures taken and online teaching practices followed by the University during pandemic

Structural Measures	Online Teaching Practices
The University provided prior support and training to the faculty before shifting completely to online mode.	The sessions were delivered online in both synchronous and asynchronous mode. The faculty prepared and communicated a revised course handout to the students more suitable for online delivery.
The university arranged for access to web based applications like Google Meet, Microsoft Teams, Zoom Classrooms and online resources of MOOC such as 'Swayam', 'LinkedIn certifications' free of cost for faculty and students.	Lecture videos and tutorials recorded by the faculty were sent to the students
Short tutorials were frequently posted on You Tube to provide larger access to students in remote areas with low bandwidth or connectivity issues for live classes.	The faculty guided students with varying levels of proficiency of IT usage whenever necessary.
The University management indulged faculties in several knowledgeable cross domain webinars, as well as virtual fun and motivational activities from time to time to help them cope with the stress and anxiety of sudden change.	Faculty mentors indulged students in several participative, fun and motivational activities weekly to keep check on students' mental health due to stress posed by the pandemic
The university arranged for access to daily and weekly online assessment platforms like 'Google forms', 'Moodle' & 'My Anatomy'.	Faculties were vigilant and receptive of students' concerns and doubts. Doubt sessions were taken daily for 1 hour to ensure effective learning.

Structural measures by educational institutions, and Faculty training, all linked to usage of technology were found to be fundamental in achieving the objective of student learning.

Practical Implications:

The study provides some extremely useful insights to academic institutions as the initiatives and steps taken by the university provides an experiential layout for future, in case any similar situation arises. The study highlights how structural changes during emergency remote learning can provide better support under given circumstances, engage students, provide opportunity for accelerated learning and develop independent learning skills through a personalized learning experience.

Although the journey of the university's transformation from traditional to digital seems smooth, there were certain challenges throughout the way. The research can be further subjected to analysis to find out better ways to cope with the challenges encountered due to sudden transformation like students without reliable internet access and/or technology struggled to participate in digital learning, barriers to student participation in group presentations and assessments, coping with sudden change, anxiety due to all the negativity around because of the pandemic, issues associated with usage of technology, or difficulty in peer interaction.

Conclusion

The structural measures taken by the university during pandemic to facilitate online teaching was exemplary. The usage of Learning Management Systems by the university to administer online courses, host a virtual classroom, student assessment and monitoring student progress is highlighted throughout the study.

For learners, the online environment served both as a challenge and as an opportunity. While the online classrooms have made a whirlwind of turmoil, there were significant advantages to a virtual class. Students kept taking an interest in conversation areas and talks without the travel time. Faculties' promotion of facilitating sessions, productive discussion and engaging students proved to be successful as both the student enrollment and daily attendant rates were found to be very high.

Collaborating online and empowered student learning proved to be fundamental to the accomplishment of the student learning objectives.

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Pallavi Sood is an Assistant Professor at Chitkara University, India. She has an overall teaching and research experience of 6.5 years. She specializes in Finance and Human Resource Management. Her research interests include Banking Frauds, Education and Financial Management. During her research, she has published research papers in Inderscience, Springer and Web of science journals. Ms. Pallavi has served as a reviewer for many Journals like Journal of Public Affairs, Asian Journal of Business ethics and many more.

Kulwant Kumar Sharma is a Professor and Dean (UG) in Chitkara Business School, responsible to mentor and administer UG courses since 2014. He is an OB & HR student, with a vast experience in Leadership positions in the Indian Army, UN peace operations, and trainer with the UNHCR. His academic teaching and research experience spans from 1985, till now in multiple positions and organizations at national and global levels. In management education, he has been engaged since 2006 as head, director, regional head, HOD and Dean with various organizations. He was an active member in planning and writing of UN Capstone Doctrine on peacekeeping and manuals for trainers in the Office of High Commissioner of Human Rights, Geneva. Dr KK Sharma has a research interest in online higher education, peace operations and human rights. He worked on a missile project under Bharat Dynamics Limited, Hyderabad and on a radar testing project under Bharat Electronics Limited, Bangalore. As a trainer, he has headed Chandigarh Chapter of Corporate Training under You-Peak Solutions, trained international peacekeepers for seven years and many NGOs in refugee and disaster management in Tokyo. His academic qualifications: Ph D in Management (Zurich); MBA (HRM); M Sc (International Relations), PGD Human Rights and B Sc (PCM).

Rajeev Kumar working, as an Assistant Professor, at Chitkara University Institute of Engineering and Technology, Chitkara University, Punjab, India. He completed his Ph.D. degree in Electronics Engineering from Banasthali University, Rajasthan, India, in 2017. His research interests include almost aspects of Antenna Design with special emphasis on Frequency reconfigurable antenna, Ultra wideband antenna, Multiband antenna and Slot antenna and also include Internet of Things (IOT). During his research, He has published 30 research papers in various reputed publishing houses like IEEE, Wiley, Elsevier, Taylor and Francis, Hindawi, PIERs and many more. Dr. Kumar has been served as a reviewer for many Journals like Wiley, Elsevier, Taylor and Francis and PIERs, etc. and also worked as a reviewer for ICICS-2016 for the track of Antenna Design.