European International University, EIU-Paris

Professional Doctorate Thesis

Title:

[IMPACT ON ACADEMIC PERFORMANCE OF UNIVERSITY STUDENTS POST COVID USING E-LEARNING MECHANISM DURING COVID]

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Abstract

Higher education institutions across the world swapped to E-learning mode in times of COVID to avoid the discontinuance of education. No doubt, this mode helped the educational institutions teachers to cover the content as per the convenience of the content but had severe consequences on the academic performance of the students once it revived back to normal. This humungous change disrupted the entire learning system and resulted in problem of adopting the same. Not only the learning system was alternated to the online mode but also the evaluation mechanism was interchanged to the same mode. Though the entire world was struggling to provide unwavering support to the learners and was ensuring ceaseless conduct of learning, but it also resulted in unbalanced equilibrium towards learning and understanding. This significant efflux of e-learning using digital learning platform carried it tremors post pandemic. Thus, once this pandemic subsided and learning mechanism resumed back to normal using traditional mechanism the impact was quite noticeable when the students were unanswerable to the topic covered during e-learning mechanism.

A comprehensive search was conducted on multiple databases for the relevant studies published. Furthermore, reference lists of studies associated with previous research were used to fetch additional relevant studies. The search terms used were Covid-19, E-learning, academic performance, post covid, university students. An insertion and exclusion measure were taken to shortlist the most relevant articles for final review. Studies were taken into consideration if they inscribed higher education e-learning, challenges and opportunities during and after pandemic.

Though majority of studies have been published on the pandemic, but only limited have addressed the post pandemic performance.

Hence, this study aimed at examining impact of COVID-19-induced e-learning on the university students' academic performance post COVID.

Keywords: Covid-19, E-learning, academic performance, post covid, university students

Chapter 1: Introduction

1.1 Research Background

Education being the primal concern of countries, institution and individuals as it helps in overall development of an individual. The quality of education is assessed through the result or outcome of the education system.

The coronavirus (Covid-19) that was reported in Wuhan city in China during December 2019 (Holsueet al., 2020) created unparalleled heath calamity across the globe. This imperceptible havoc shook the entire traditional mechanism of learning. Where on one side the entire world was fighting to revive human health by imposing lockdown as per WHO declaration (WHO 2020a, 2020b) simultaneously the education institutions were ensuring continuity of studies using online learning as platform. According to UNESCO, 186 countries had imposed nationwide shut down, by April 2020, affecting 73.8% of the total learner enrolled (UNESCO, April, 2020). This e-learning played a vital role in designing, planning, conducting, and evaluating students' performance. The education institutions were ensuring that the students should not be left behind and were ensuring that the learning is continuous even during pandemic. But concurrently, the efficacy of the e-learning was dependent on the level of adoption by the learners of academic institutions. The solace of traditional learning is different in comparison to e-learning in terms of exposure, satisfaction and collaboration amongst the learners (Bignoux and Sund, 2018). Online courses seek to amalgamate social networking components with professional content as online resources grow daily (Hiltz & Turoff, 2005; Lowenthal, 2010). Such approaches rely on the active participation of many learners, regardless of educational goals, abilities, previous backgrounds, and experiences (Littlejohn & Hood, 2018; McAuley, Stewart, Siemens & Cormier, 2010). The emergence of online education has provided a unique opportunity for flexible access to learning. Today technology is a tool which provides one with an opportunity to learn anytime and anywhere.

Henceforth, universities with their curriculum review committee spent splendid time in reviewing the curriculum and evaluation mechanism wherein the learning and evaluation was switched to online mode. Thereby, to address the need of online learning, PPT were being used to explain the content even online whiteboard was being used to explain the content. In

majority of the cases the evaluation mechanism was switched from manual to online with the same pattern.

Post pandemic majority of the students were seen with inability to answer to the topics covered in online mode.

1.2 Research Aim and Objectives

Aim

The main objective of this research study is to examine how academic performance of university students were impacted post Covid using e-learning during COVID. Against this background, the research study aims to examine the factors responsible for impacting the performance. At the same time, the research aims to discover new ways of working that can help boost academic performance by adoption of certain strategies to fix the same.

Objectives:

▪ To examine how academic performance of university students were impacted post Covid using e-learning during COVID

▪ To determine the factors responsible for impacting the academic performance of university students.

▪ To explore how the academic performance of the university students can be boosted by adopting certain tools and techniques

1.3 Research Questions

The research questions developed for this research study are presented below:

RQ1: How academic performance of university students were impacted post Covid using e-learning mechanism during COVID?

1.4 Organization of Research

This research paper is constructed in the flow of Chapter 1 Introduction, Chapter 2 Literature Review, Chapter 3 Research Methodology, Chapter 4 Findings and Results, Chapter 5 Discussion, Chapter 6 Conclusion and Recommendations, References

Chapter 2: Literature Review

The following section presents the previous studies conducted in online learning during the COVID-19 crisis and some studies related to online learning challenges and educational technology in general. In order to develop a clear understanding of what affected academic performances of the students post covid, it was necessary to review previous literatures as well as best practices in traditional and online teaching and collect the factors that best demonstrated its impact.

2.1 Impact of Covid 19 on education system

As Covid 19 pandemic led to the restriction of physical gathering which led to the closure of schools, colleges and universities worldwide which led to the advent of multiple online platforms. It has become one of the prime necessities since outbreak of pandemic in 2019 which is actually helping the educators to provide quality education (Tadesse & Muluve, 2020). In order to address the need of the hour this switch from conventional face to face to an online learning has resulted in various troubles for the learners as well as the educators. The meteoric developments in technology have made distance education easy (McBrien et al., 2009). Mostly labelled as online learning, open learning, web-based learning, computer-mediated learning, blended learning, m-learning, have in common the ability to use a computer connected to a network, that offers the likelihood to learn from anywhere, anytime, in any rhythm, with any means" (Cojocariu et al., 2014). Thus, online learning has evolved as more student centric and more flexible. Eventually, this gives an advantage for the learners and the instructors to interact from anywhere (Singh & Thurman, 2019). The rate of online learning has been ballooning every year with an approximate rate of 30% every year, the number of students taking at least one online course has been grown to 34.7 percent of the total learner's population worldwide. The university closure has resulted in making 1.2 billion learners out of the classroom. Hence, making an exponential rise in distance learning resulting in remote and digital learning. According to Hodges, well-planned online learning is mismatched from shifting online in response to a crisis, as the speed with which this shift is done could be shocking to faculty members and learners.

2.2 Augmentation of E-Learning

The outbreak of Covid 19 forced the universities to close traditional face to face learning and send students home which transformed the traditional learning to modern learning like artificial intelligence (Di Vaio et al. 2020a). This extensive term in itself includes technology-based learning through websites, learning portals, video conferencing, YouTube, mobile apps, and thousand types of free available websites for blended learning tools (Shahzad et al. (2021). The emergence of e-learning provides the students with an opportunity to view recorded lectures. However, it also vital that the lectures are accessible from the mobile phones apart from the laptops. The benefit of online learning is that it covers wide range of students at the same time. E-learning is initiated as a radical part of the student learning experience in the higher education. It is no longer a key business with a mission to address distance education , its reasonable affordance has been integrated in the students learning experience. Affirmation of this widespread can be witnessed in research journals and on the websites of the national bodies liable for leading learning and teaching in higher education (Ellis, Ginns, & Leanne, 2009) . To be more pliable, un-prejudiced and inclusive, education systems must transform, using technology to benefit all learners and building on the innovations and partnerships that have emerged throughout this crisis. UNESCO is bolstering countries in their efforts to reduce the impact of school closures, address learning loss, support teachers and adapt education systems, especially for vulnerable and disadvantaged communities (UNESCO, 2020).

2.3 Challenges associated with E-Learning

Despite the fact that E-Learning ensures maximum coverage in message delivery to the targeted listeners. But the fact that cannot be denied is that still it is unable to reach the equivalent status in many regions due to its practical implementation (Ab Wahab & Mohamad, 2022). Though E-Learning played a pivotal role when the traditional mode of education came to stand still during pandemic (Subedi et al., 2020) but still the learners inalterable mindset found it difficult to transform to a new learning environment. The fact that cannot be denied is that distinct courses, subjects and age groups demand different approaches to online learning (Doucet et al., 2020). Nonetheless, the traditional mode of learning provides an opportunity to discuss among their peers and professors. Face-to-face

learning is an essential part of practical learning experience as there are multiple technological difficulties associated with the e-learning process as a continual and stable internet connection is the prime need for its uninterrupted learning experience. A study conducted by Aboagye et al. (2020) as cited in Heng and Sol (2021) associated that key challenges faced executing E-learning are related to technological infrastructure and digital competence, socio-economic factors, assessment and supervision, and heavy workload and compatibility (as cited in Heng and Sol, 2021). Likewise, a study conducted in Malaysia by Bibi Noraini and Jihan (2020), revealed six significant challenges for universities, educators, and students when implementing E-learning methodologies: ICT infrastructure, required online skills, platform security, motivation for lecturers and students while using the online method, and context-specific.

Several other challenges experienced by educators was acquaintance with online platforms and also the ability to provide feedback as the online class ended automatically once the duration of the class was over. As educators they faced technological difficulties in gauging students' participation in using My Class as a platform as the student's engagement can be checked only through poll which at points was not accurate as the students clicked on the options unknowingly without even reading the questions.

Another, major challenge experienced in using My Class as a platform by codetantra was students logged in to the class without using camera and the microphone as an option and hence were unable to map the seriousness of the students.

Many previous researches have explored a variety of hinderances confronted by both learners and educators. Learners encountered innumerable obstacles, including administrative concerns, social interaction, academic and technical abilities, motivation, time constraints, restricted access to resources, and technological difficulties (Barrot et al., 2021). These problems are comparable to those identified in previous research, including a delay in receiving feedback from educator, a heavy reliance on technology, and poor learners' performance and satisfaction (Chung et al., 2020). Furthermore, the aforesaid difficulties might have originated due to the feeling of aloofness, as learners see themselves as an online component (Sahu, 2020). Meanwhile, various issues have been identified, including learners' attitudes, personal resources, time limits, lecturer self-efficacy, and technological difficulties (Zhu et al., 2018).

An important thing to note is that every learner has a different learning potential with online learning apps and platforms (Haleem et al., 2020), as some learners may be more agile while others may take longer to get familiarized with the system. Thus , the latter category of learners find it boring and monotonous. Individual attention is one such thing which every learner relish which has failed miserably during pandemic phase in online learning. Students sense lack of community, technical problems, and difficulties in understanding instructional goals are the major barriers for online learning (Song et al., 2004).

The inherent motivated learners are relatively unaffected in their learning as they need minimum supervision and guidance, while the susceptible group consisting of students who are frail in learning face difficulties. Some academically competent learners from economically disadvantaged background are unable to access and afford online learning. The level of academic performance of the students is likely to drop for the classes held for both year-end examination and internal examination due to reduced contact hour for learners and lack of consultation with teachers when facing difficulties in learning/understanding (Sintema, 2020).

Despite the fact that there are humungous perks associated with E-learning , however , technology has it own demerits ranging from downloading errors, issues with installation, login problems, problems with audio and video, and so on.

The fundamental challenges include cultural differences, technical difficulties, time management, difficulty writing and receiving written feedback, and life events interrupting study. Additionally, faculty members often feel bounded in the ways they can mentor online students, indicating the need for professional development and instructional support at the institutional level (Kumar & Johnson, 2017; Pollard & Kumar, 2021).

The proposed action plan while conduction of the online examination depended on a large extent on the convenience and the expertise of the educators and the congruity of the students. Since, there is a humongous number of students participating in the evaluation hence, effective steps needs to be taken to check the plagiarism while appearing for an evaluation.

The students have become more susceptible to online violation due to stretched hours spent on virtual platform.

2.4 Student's conception about E-Learning

The outbreak of corona had invoked mixed feeling among the students regarding online learning. Where on one hand it had positive affirmation among the students in terms of learning ability as it subsequently bumped the opportunity to interact with their professors and trainers, hence, they can get help and support anytime (Gonzalez, de la Rubia, Hincz, Comas-Lopez, Subirats, Fort et al., 2020; Gopal, Singh & Aggarwal, 2021).Contrary, to that there were other students who faced obstacles such as low I.T. literacy, limited visualization, the absence of direct classroom communication, and poor internet connection lead to futile teaching and learning (Agung, Surtikanti & Quinones, 2020; Thandevaraj, Gani & Nasir, 2021). Students require digital skills to find, evaluate, and use information in the digital environment. Online platforms focus to create a reciprocal learning environment kernelled on the student, ensuring an individualized learning process and permanent access to information resources. With an online asynchronous discussion structure, the learner is provided with an opportunity to articulate responses by seeing the comments from the previous one. However, in traditional mode of learning must analyse on the spot otherwise misses an opportunity to contribute to the discussion.

In an online discussion mode, the students' needs to respond individually to the course material thus giving them a chance to evoke smaller conversations within the group. Hence, they have an access to read all the contributions made by their peers and thus actively engage in dialog matching their own interests. This provides a liberty to control their discussion.

In an online environment the learners have the reticence thus avoiding any discriminating factors on the basis of age, gender, physical appearance, and race. This brings the entire centre of attention to the content, invariably this provides a sense of responsibility to keep the discussion focussed to the material at hand.

2.5 Impact of Covid 19 on academic performance of students

It is furthermore believed that there will be a dip in academic performance for the end term and the mid term examinations conducted due to scaling down of the contact hours of learners and lack of huddle with their trainers when encountering challenges in learning (Sintema, 2020). The assessment being conducted for the students is with lots of test-run creating unsureness among students and the teachers.

A step towards conducting an online evaluation is dependent on the expertise and convenience of the teachers and harmony of the learners. Appropriate measures need to be put in place to avoid plagiarism where in a large chunk will be appearing online. Hence, amidst covid a lot of examination have been postponed or cancelled to address this nationwide outbreak. Nonethless, some students were benefitted during the situation and were provided with a degree and promoted to higher classes on pro-rated basis.

Textbooks are believed to be one of the major contributors in preparing students and playing a vital role in academic performance of the students. Thus, a halt in approach of text books during the Covid phase will significantly affect their performance.

2.6 Impact of Covid on quality of E-learning

Since the advent of Covid 19 has urged the educational institutions to embrace online learning regardless of how ready the students have been for the transformation. This unanticipated shift has initiated a discussion on the quality of e-learning and the satisfaction among the students for the continuous usage of e-learning platforms. Enhancing student satisfaction by improving the quality of e-learning has resulted in the greater efficiency and effectiveness of the e-learning. The technology model acceptance applied by Alhumaid et al studied the teacher's perception related to online learning as a substitute to formal education during pandemic outbreak in Pakistan. There was a strong relationship found between communication facility, knowledge sharing, motivation, usage of e-learning and e-learning amongst the instructors involved. Also, Tj anTanuraharjo studied the impact of covid on the quality of learning in Indonesia which also revealed a stronger correlation between e-learning quality and the student satisfaction. However, the transition in Thailand has been a national challenge during transformation of offline to online learning. Although the factual evidences as represented through various attempts reveals a better understanding with e-learning during pandemic, but still there is a need for policy makers, academics and practitioners due to the multifariousness of countries e context.

As per the argument raised by Stella and Gnanam the evaluation criteria for e-learning and face to face education should be done using the similar criteria. On the other hand Jung believed while considering quality evaluation, specific aspects like differentiated communication, open access to multiple resources , and delivered learning should be taken into account. While going through e-learning as a module student motivation and dedication has to be the constant driving force thus making it hefty to measure the quality of e-learning.

2.7 Student satisfaction while using e-learning

As per Chow and Elliot, student satisfaction can be defined as a short-term attitude resulting from an evaluation of student's educational experience, services and facilities. Weerasinghe and Fernando reviewed almost 44 appropriate articles that were published between 2014 and 2017 and it was observed that the factors which notably affect student satisfaction were instructors' presence in online settings, interactions between student's teachers and content and planned connections between online and offline activities and between campus related and practice related activities. In comparison to this the study of Boyd had varied findings where the students expressed dissatisfactions due to insufficiency in communication with educators, general misunderstanding arising about instructor expectation, and unreliability about their assignment evaluation. Another factor highlighted was a restriction in interaction with their peers during e-learning. Thereby, students were found to be learning less in an e-learning environment. Students' perception also revealed that e-learning is time consuming in contrast to face-to-face interaction.

Nasir claimed that the students who proclaimed high level of satisfaction were possibly projected high level of interaction with peers in an online platform and also were also having high level of social existence. Thus, it was evident that the social presence was one of the prime factors contributing to the satisfaction related to course amongst the students. Hence, the academic structure should focus on open communication, group interaction and useful personal connections.

As per Muzammil et al. there was a positive influence on student satisfaction due to student-teacher and student-content interactions. The rapport building process as highlighted in the study of Flanigan et al. focuses on usage of rapport related assessments while in online platform.

Interpersonal interaction in an e-learning environment can be broadly classified into student-student and student-instructor interaction. It invokes a sense of familiarity and value if they are able to communicate with ease and freedom with the instructor in e-leaning platform. It also originates a sense of kinship when they interact with their peers and exchange knowledge with each other.

Students' satisfaction had a positive relation in terms of psychological commitment between instructor and the student. Others factors which seem to be influencing students' satisfaction

was quality of e-learning, students' achievement, readiness of availability of learning resources and other psychological factors seemed to sway students satisfaction.

2.8 Contemplating success factors

A study conducted by Cidral et al. (2018) in Brazil affirmed information quality, system quality and instructors' attitude towards e-learning to be the major drivers in enhancing students' satisfaction. On the others hand, as confirmed by . Sorgenfrei, Borschbach, and Smolnik (2013) technical and design size, individual motivation and environment characteristics serves to be the major drivers towards satisfaction. Cheng (2011) inspected e-learning acceptance predictors and found that ease-of use, perceived enjoyment, perceived usefulness, system factor, network externality factor, individual factors, and social factors are the main operators of acceptance of the e-learning system. Contrary to that , the major components for low satisfaction as elucidated by Frankola (2001), were failure in supervision of e-learning structure, the lack of motivation, students not having sufficient time, poor graphic design, and instructor deficiency. Wang (2003) observed that students' satisfaction with e-learning was associated to factors such as: learning community, student interface, customization, and content. Sun et al. (2008) insisted that the determination of e-learning success is a blend of factors such as: technology, student's dimension, design, and environment. Selim (2007) declared the pivotal factors for e-learning success into four groups: student, university support, trainer, and information technology.

While understanding students' attitude towards e-learning, the major domains associated are affect, behaviour and cognition. Emotional engagement is a derivative which arrives from affective engagement and deals with students' emotional responses to learning. As deduced by Xie, Heddy & Greene, 2019 higher achievement and self-regulation are an outcome of progressive emotions. Conversely,Baker et al. (2010) elucidated that dullness is correlated with lower engagement and poor outcomes.

While reviewing students' behaviour different researchers have different thought process. As professed by Boud & Molloy (2013) learners' feedback exhibits commitment that can inform instructors of their satisfaction and dissatisfaction. Its imperative that to understand in an e-learning environment the students should have interaction with other students which delivers quality results. Researchers like Revere and Kovach (2011) and Banna et al. (2015) observed that discussion boards, chat sessions, blogs, wikis, group tasks or peer assessment provide platforms in encouraging student-to-student interaction in online courses that show their

involvement and participation. Thereby, an interactive approach between students is seen to have significant impact on endorsing e-learning as a medium (Premchaiswadi et al., 2012).

While exploring cognitive engagement mental effort and thinking tactics seems to have profound impact towards students' satisfaction. Since, e-learning is not a traditional mode of learning thus making students accountable for their learning through strategies becomes utmost important. The accountability among students will bring a sense of responsibility to achieve and acquire desired results. The level of cognitive engagement can influence the learning and motivation amongst the students (Sedaghat et al., 2011). This type of engagement is very hard to extrapolate due to paucity of face to face interaction and is thus arduous to determine and observe (Barkley & Major, 2020).

2.9 Trainee Motivation

During the drastic shift of the entire education system during pandemic it was very essential that the students stay constantly motivated to adapt to the new form of learning. So, motivation can be defined as what inspires students to dedicate time to a certain task freely. Also, as their attitudes and feelings about the activity, as well as how long they remain committed to the task (Filgona et al., 2020). Many motivation theories describes motivation as two faceted i.e intrinsic and extrinsic motivation. Where on one hand intrinsic motivation is ruled by personal intention or choice , extrinsic motivation is favoured by unmotivated behaviour performed involuntarily (Deci et al., 1991).In addition to the above 2 stated broad categories another facet presented by Ryan (1985) was amotivation which actually signifies lack of motivation. As per Bozanoğlu (2004), academic motivation is "generating the necessary energy for academic tasks". In simpler language it specifies the tendency of motivating and being motivated (Ayvaışık et al., 2000). There are multiple factors that determine academic motivation ranging from the field of study, the duration of the study, the social history of students, the environment, and students' expectations (Wilkesmann et al., 2012). As suspected the students motivation is likely to alter in an online learning environment. Owing to it the research has shown that academic performance positively correlates with academic motivation (Coetzee, 2011; Henning, 2007; Komarraju et al., 2009). Since, the advent of e-learning mandated university students to spend more time on computers, it will affect academic motivation.

Family motivation is one of the essential factor required in thriving learning motivation as per Mardiana and Sugyaningsih, 2018, this being the smallest unit impacts the development of children from toddler to an adolescent age comprising of parents and the siblings. Since, education is supported by family in order to achieve goals for a prosperous future through parents , thus , it is associated with affecting student learning outcome. . Research has shown a clear connection between parental involvement and children's success in school (Samir, 2014). Also, research has also show cased a knot between parental involvement and educational development of a child and consequently leading to academic motivation (Hamjah, 2010). Families plays a crucial role in maintaining a positive motivation even though they lack the required skill set to train a student. Consequent family motivation fosters competence and controls positive motivation among students.

2.10 Instructors technological adeptness and pedagogical plan of action

Since, e-learning bridges learners across the globe thus it becomes quite evident that frontline educators must possess the necessary expertise to empower the students. In order to deliver efficient learning, the required skill set is expected out of educators g (Collier, Weinburgh, & Rivera, 2004). This in summation includes computer skills, social media skills and other blended mode of skills essential for quality delivery. As a part of curriculum designing, pedagogy plays a significant role and the academic institutions ensures that it is moulded as per the preference of the learners. Digital technology has revolutionised the way people think, communicate and live, also the way they learn Mynbayeva, Zukhra, & Akshalova (2017). Thus, it becomes imperative for the educators to continuously upskill themselves to level upto the industry requirements. Hence, not only delivering quality teaching is important but the way it is perceived by the students through feedback in order to check their understanding is also important. Acknowledging the same fact Bain et al. (2017) highlighted in his research that taking feedback is instrumental not only for the educator but to the organization as a whole.

21st century demands teachers and students to become digitally independent and embrace new technology and develop strategies to analyse and deploy it. The traditional mode of learning that was a legacy since years shook significantly during Covid and demanded more digitally literate teachers across the world. The lectures were found to be lacking the inclusivity of e-learning as a platform and at points both the teachers and the students were found struggling in maintaining the equilibrium of learning. As per the study conducted by Avgerinou and

Moros pandemic was a check to the digital deficit not only from the stand point of embracing technology or student skills but also regards teachers' perceptions, attitudes and actual preparedness (Avgerinou and Moros 2020, 587). This paradigm shift called for a technical expertise in terms of handling the online classes. Though there was a significant number of teachers who actually handled the situation well even though their experience in digital skills were limited.

2.11 Importance of E-learning preparedness

The knock of covid across nation was inconceivable and required the entire nation to switch to an online mode of learning. The advent of e-learning model integrates four important pillars in the educational process: learning media, ICT such as the internet, digital platforms, and video audio teleconferencing (Holmes et al., 2019). No doubt the teachers were at ease during virtual classes as it can be delivered anywhere without requiring physical presence in a room (Osman,2020). The initial phase of Covid led to drastic use of e-learning which had its own problem areas including accessibility of devices and facilities, followed by network access too (Hamid et al., 2020). Eventually, these continued hours of online learning came with its own demerits leading to body fatigue (Octaberlina and Muslimin, 2020), psychological disorders (Atmojo and Nugroho, 2020) and instability of internet connection for a streamlined experience (Febrianto et al., 2020). One of the crucial factor to be kept in mind is before launching e-learning it should have been tested for its readiness and efficacy (Gay, 2016; Widyanti et al., 2020). However, as affirmed through various studies the unpreparedness led to failure in execution (Cos¸kun et al., 2018; Widyanti et al., 2020). Readiness in this situation is also an assessment related to the overall availability of aspects on the grounds of psychology, physical competence, and the availability of tools for the main learning needs (Holmes and Gardner, 2006). This is also validated by Mabrur et al. (2021), and Watkins et al. (2008) e-learning readiness is the level of physical readiness that refers to the infrastructure at the institution to implement the e-learning process. Continuing with the same, e-learning readiness refers to basic capital (psychology and skills) in human resources and important infrastructure which are the main needs. All aspects encompassed in the readiness must at least be fulfilled (Oketch et al., 2014). In order to ensure the success of e-learning organizations should have ensured that the students have the ability of technology in order to support e-learning. In addition (Cos¸kun et al., 2018; Nurtanto et al., 2021), indicate

that the competence to use technology and its supporting equipment is a major requirement in implementing e-learning, so that they are able to experience seamless benefits from it.

In addition to the above stated factors the satisfaction among the students being the recipients of electronics lectures plays a vital role. The institutions need to ensure that the expectations set by an organization while delivering electronic lecture is met and there needs to be compatibility between the same to achieve maximum efficiency. Yilmaz (2017) announce that encouraging students to learn in an online platform must encompass and monitor their satisfaction. Thus, in order to ensure efficient satisfaction during the use of online learning should ensure that the students are provided with good facilities, infrastructure and accessibility as stated by Topal, 2016.

From a future career development standpoint of student's facilitation of academic success is important. It was observed through various researches that there was a decline in academic motivation (Aboagye et al., 2020) leading to learning loss (Kuhfield & Tarasawa, 2020; Turner et al., 2020). One of the thing to be considered is that online learning does not only requires the tendency to have a proper place and the computer but expects certain skill sets too. Computer and Internet self-effectiveness perturbs students' confidence with computer and Internet use (Hatlevik et al., 2018; Torkzadeh et al., 2006). Exercising self-control and avoiding distraction during the usage of online learning in order to ensure continued focus while going through the online learning is of prime importance. Thus, factors contributing to the online learning performance includes having computer and internet self-efficacy, self-control in online contexts, and online communication self-efficacy.

The emotional experience of students is one of the determining factors to evaluate e-learning success. As Covid-19 disrupted the traditional mode of learning, thus it has led to tremendous level of stress among students. However, this rising stress will not be having promising effect on students learning and psychological impact. Students who have come across with this are likely to develop anxiety, panic attacks, depression, mood disorders, and other mental illnesses.

The basic requirement of 21st century learning comprises of self-regulated learning , where the learners take their own charge of the learning. As per Harari (2018), specifically mentions that the students need to learn adaptability, learning how to learn, resilience, curiosity, critical thinking, problem solving, and effective collaboration. The availability of teachers at every

single point is not practically possible even though online learning is quite flexible but still hours of availability is still a restriction. Thus, autonomy in learning is generally expected for the students to learn uninterrupted. Thus, a strategically planned learners knows how to go beyond and take charge of their own learning.

2.12 Impact of emotional competence on academic performance

Some of the deleterious effects faced during Covid include loneliness due to restricted movement, loosing of beloved members, critically ill members at home, thereby impacting mental health of the students (Alzueta et al., 2020; de Pablo et al., 2020; Salari et al., 2020; Taquet, Luciano, Geddes, & Harrison, 2020; Xiong et al., 2020).

The academic performance of the students is negatively impacted by depression and anxiety (e.g., DeRoma et al.,2009; M. Richardson et al.,2012). Thus, one of the saviours that can be advantageous to the university is a sense of connectedness. The hypothesis for this has come from the longstanding research literature on the impact of relationships and social support (or their lack) on physical and mental health (e.g., Holt-Lunstad et al.,2015). Some of the key factors which resolved this problem was peer mentoring schemes to foster collaboration (Akinla et al.,2018; Collings et al.,2014) and culminating stress and anxiety (Kachaturoff et al.,2020). The humongous use of technology during COVID-19 expected greater flexibility from university students and the teachers. In addition to it a secluded life in home during pandemic jeopardized the experience of university life, impacting academic studies, and narrowing the horizon of social support, which play a vital role in university life. Another factor which triggered anxiety during pandemic was concern about education, examinations and the progression to the next academic year. Since, pandemic led to the shutdown of earning sources another factor which triggered anxiety was instability in family income to bear the education expenses and fees.

In regard to higher education, COVID-19 has affected more than 89% of higher education institutions in the world (IAU, 2020). It is quite evident that COVID-19 has impacted the mental wellbeing of the students and is still continuing to follow the same trajectory (Tang et al., 2020; Wang C. et al., 2020; Fruehwirth et al., 2021).

2.13 ICT challenges during COVID

During pandemic ICT has played a significant role in education. This sudden dramatic shift in the education has enforced the usage of ICT in developed and developing countries both.

As per the report by UNESCO 2020, the pandemic has a catastrophic impact on global education (Statista, 2020). By May 2020, 95% percent students around the world have been distressed by the outbreak of the virus, representing 1.7 billion of the students worldwide, from kindergarten to postgraduate, in more than 200 countries (UN, 2020) where governments around the world instructed closures of schools and universities. ICT based education has its own pros including being interactive, ease of usage and academic evaluation (Binyamin, Rutter, & and S. Smith, 2019). It also has an upper hand in providing education without any constraint of time and place, readiness to access different resources and promoting collaboration. The usage of ICT has been found promising in high schools and undergraduate levels with inclusivity of factors like infrastructure, methodology, techniques and its application (Al-Ansi, Suprayogo, & Abidin, 2019).

Invasion of mobile phones, laptops and cell phones had made the access of e-learning an easier task without any restriction of time and place. As per some of the studies the usage of mobile phones spurred to 7.9 billion devices during this phase (Criollo-C, Luján-Mora, & and A. Jaramillo-Alcázar, 2018). It also comes with a benefit of controlling the content and its presentation, adaptive and readiness in delivery of feedback (Padurean, 2009). The usage of online learning opened the doors to plethora of apps that were used during Covid like Zoom, Google meet, Webex etc. There were multiple platforms that made the use of e-learning easy as the lectures can be uploaded in the recorded format. The major benefit of this was that the entire learning became self-paced and the user can access the videos later on for better clarity is the things were not clear in the session. The use of ICT in education made it to be a student centric approach where the learners session was designed keeping in mind various ICT tools.

The major cons associated with ICT based learning comprised of challenges associated with speed, coverage and cost of internet which hindered the learning process. Also, spiking cost of infrastructure, managing classrooms and maintenance of hardware and software had its own deleterious effects . Many studies supported the hinderance in the delivery as showcased in a study by Cox, Preston and Cox (Çakici, 2016) highlighted some problems related to using ICT in classrooms such as inability to use software and hardware of ICT, shortage of technical support, shortage of time to use ICT, some difficulties related to access resources, restriction of content and insufficient resources in technology are the major ones.

Chapter 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the formation of a research design and methodology adopted to achieve the stipulated goals for the study. It is also to probe and enhance disruptions faced by students in their academic performance post Covid using e learning mechanism during COVID, using quantitative research methodology as the tool. Structured tools such as surveys, polls, or questionnaires are used to gather quantitative data. Using such structured methods helps collect in-depth and actionable data from the survey respondents. Close-ended questions: Closed-ended questions are created per the objective of the research. The elements involved in this study are research design, population sample, instrument used, data collection techniques, and data analysis procedures in detail.

The study design involved 91 students from various academic streams in the university. An online questionnaire was used to collect various types of information which impacted the academic performance of the students including quality of content, submission of assignment, feedback, examination conduct, collaboration, engagement, teachers being equipped with the platform and readiness of availability of the teachers.

3.2 Research Philosophy

In the research studies, the research philosophy of positivism focusses on examining factors impacting academic performance of university students post Covid using e-learning mechanism during COVID. The organization new ways of working using e-learning must be examined by university as a realistic phenomenon. The positivism philosophy supports data collection in a quantitative form and in an objective manner. Therefore, objective data must be collected using the survey method and considered the most appropriate approach in this research. The positivist philosophy tend to acquire factual knowledge based on the realistic experiential data and is there selected as the fairest philosophy in this study (Kaushik and Walsh, 2019).

3.3 Research Approach

In quantitative research studies, the deductive approach is considered a suitable approach to control the entire research process. The survey data collection method and deductive research approach support human participation in the research process and therefore considered appropriate (Mallinson, Childs, and Herk, 2013). The deductive research approach helps to examine any existing research phenomenon in the form of a scientific inquiry. Since, this study also requires some form of testing, the deductive method is used (Melnikovas, 2018). Quantitative research is a systematic investigation of phenomena by gathering quantifiable data and performing statistical, mathematical, or computational techniques. Quantitative research collects statistically significant information from existing and potential customers using sampling methods and sending out online surveys, online polls, and questionnaires, for example.

3.4 Research Design

A quantitative research methodology is chosen in this research study because the nature of the research study is quite investigative and requires data collection from various streams of higher education. Therefore, the quantitative data collection method turned out to be the most appropriate. (Choy, 2014). The research data collected using the survey method is analysed in descriptive analysis form using the graphical data presentation method in which graphs were developed for data presentation and analysis.

Population and Sample

Sampling in quantitative research is a critical component that involves selecting a representative subset of individuals or cases from a larger population and often employs sampling techniques based on probability theory. The above statement is the focal point of this study. The goal of sampling is to obtain a sample that is large enough and representative of the target population. Thus, simple random sampling was used as a probability sampling technique so that each participant has an equal chance to be chosen from a detailed list of targeted population. Individuals are chosen one at a time, independently (randomly), until the necessary sample size is reached.

This study was undertaken at Lovely Professional University, India as I had no access to others. It ranks among the Top 100 Universities in India by NIRF, Govt. of India Ranking. The university comprises of multiple schools namely LIE (Department of Education)/LSE (Department of Education), LIT (Pharmacy)/Department of Pharmaceutical Sciences, Lovely School of Architecture & Design, Mittal School of Business, School of Humanities (Films and Performing Arts), School of Agriculture, School of Allied Medical Sciences, School of Bio Engineering and Biosciences, School of Chemical Engineering and Physical Sciences, School of Civil Engineering, School of Computer Application, School of Computer Science and Engineering, School of Design (Interior & Product Design), School of Design (Fashion Design & Technology), School of Design (Multimedia), School of Electronics and Electrical Engineering, School of Hotel Management and Tourism-I, School of Hotel Management and Tourism-II, School of Humanities (Fine Arts), School of Humanities (Journalism), School of Humanities (Social Sciences & Languages), School of Law, School of Mechanical Engineering and School of Polytechnic. A total of 91 students participated in the questionnaire that was sent to them online.

Instrumentation

After the careful formulation of research questions/hypothesis and sample selection next step in research chain is developing data collection instrument. Hence, questionnaires are chosen as a research instrument in quantitative research study as questionnaire is widely used esp. in descriptive survey studies (Borg & Gall,1983). There are multiple advantages of questionnaires as it can reach large number of people easily, less time consuming, relatively easy to analyse and provide quantifiable answers (Bailey,1982).

Each item on the questionnaire must be developed to measure a specific aspect of objectives or hypothesis. Researcher must be able to explain in detail why a certain question is being asked and how the responses will be analysed. Making “dummy tables” that show how item-by-item results of the study will be analysed is a good idea (Borg & Gall, 1983).

While creation of the questions it was ensured that the questions are closed ended and clarity of all items was ensured to obtain valid results. Short items are preferred as they are easier to understand and no negative items were included. No technical jargons were included and no doubled barred items were used to avoid misreading by the respondents (Borg & Gall,1983).

While creation of the questionnaires scaling questions are used. A final editing by the research staff is done to ensure that every element passes inspection: the content, form and question sequence, spacing arrangement and appearance (Selltiz et al., 1976).

Questionnaires/Observation

The questionnaire comprised of 24 questions and Likert rating scale were used to understand participants though process for the reason of impact on the academic results. The full items of the questionnaire are presented in Appendix A. Likert scale is one of the most commonly used scale for research as it provides flexibility for a response to develop correlation by determining the frequencies and other forms of quantitative analysis . Impact of e-learning post COVID on the academic performances of the students were studied using a five-point Likert Scale.

3.5 Data Collection Method

For conducting the exploratory research design in this study, the primary data collection method has proven to be the most suitable as it encourages the collection of first-hand data based on the real-life experiences of the individuals. The primary data collection method used in this research is the survey method due to its multiple beneficial properties, including audiences of any size, cost saving in data collection, and time efficiency with accurate results. (Oflazoglu, 2017). The survey will be conducted in the form of an online survey where the collection and the distribution of the questionnaire will be done via multiplatform of the respondents. The questionnaire instrument is designed using the Likert scale and the response was recorded on MS Excel. The questionnaire contains both personal questions and research specific items.

A suitable sample is required for each survey. In this study the selected sample are students from multiple domains of the university. The final selected sample size is 91 students from multiple domains of the university. The final sample is selected using the probability sampling technique of random sampling, in which random selection of participants is done to avoid ethical issues of discrimination and bias (Pajo, 2017).

The following table depict the data collection procedure:

Phases	Week	Instruments	Participants
1	One	Questionnaires	Students

In order to ensure proper data collection, the best practices for online surveys, suggested by Evans and Mathur . The questionnaire forms were shared with the students through email, WhatsApp and other social media platforms. The best practices that were adopted included a brief message regarding their participation in the survey for the research purposes. The questionnaire form also included the instructions regarding filling of the form. The design of the questionnaire was easy and comprised of the option selection rather than written information. The students were accessed basis my personal network across various domains in the university. The data for this study collected during various semesters during the academic year 2023-2024.

3.6 Data Analysis Method

The data collected with the survey method is always objective and numerical in nature and therefore a quantitative data analysis method is used to analyze this type of data. The method of quantitative data analysis helps to get accurate and reliable data results using proper data analytics techniques. To analyze the collected data with the survey method, the graphical data representation is used for a descriptive analysis. (Queries, Faria, and Almeida, 2017). For the purpose of graphical data analysis, the graphs are developed in the form of bar charts. This method is effective because it allows for better presentation and comparison of the data, thereby understanding the purpose of the research audience. The research study has developed bar charts in MS Excel. The data is interpreted and analyzed by percentage, with the analysis of each survey item based on the majority of responses. The insights generated from the survey data are discussed based on the insights from the literature data. Thus, a good basis was developed to arrive at the final conclusions of the research study (Rahman, 2017).

Likert items are used to measure respondents' attitudes to a particular question or statement. To analyse the data it is usually coded as follows.

- 1 = Strongly disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree

• 5 = Strongly agree

One must recall that Likert-type data is ordinal data, i.e. we can only say that one score is higher than another, not the distance between the points.

With Likert scale data we cannot use the mean as a measure of central tendency as it has no meaning i.e. what is the average of Strongly agree and disagree? The most appropriate measure for this is the mode, the most frequent responses, or the median. The best way to display the distribution of responses i.e. (% that agree, disagree etc) is to use a bar chart.

3.7 Ethical Considerations

In the academic research studies, obtaining the ethical approval is the most important requirement and therefore in order to obtain ethical approval of the committee , the research has ensured the incorporation of the defined ethical guidelines discussed here. Firstly, it has been ensured that all participants have given their voluntary consent to contribute and partake in the survey process and there is no pressure on them to participate in this process. All the participants were then ensured that their personal data would not be passed on or misused at any time. (Clark- Kazak, 2017). The personal data is anonymized and kept confidential in a password-protected computer. This is to avoid the problem of unauthorized access to the data by other illegal parties. The research study has also ensured that the researcher is not involved in any scientific misconduct such as plagiarism or copying of works in order to address the issue of copyright infringement (Tripathi, 2013). The research study also ensured that in the sample selected for the purpose of the survey, none of the participants belonged to a vulnerable group.

3.8 Summary

Overall, the research methodology chapter has shown that the data collection in this research was conducted with the help of quantitative research methodology in which the survey method of primary data collection was used. The analysis of the research data was carried out using the quantitative data analysis method of graphical data representation. Quantitative data is used when a researcher needs to quantify a problem, and answers questions like “what,” “how many,” and “how often.” Surveys and questionnaires are commonly used in quantitative research because they are both effective and relatively easy to create and distribute. With a wide array of simple-to-use tools, conducting surveys online is a quick and convenient research method. As discussed previously, students from various domains of the university participated in this survey to understand the effect of e learning on academic

performance of the students post Covid. Several ethical considerations were reviewed in this research study to ensure that it is conducted in a valid and reliable manner. Research has ensured that none of the research results affects and individual's value. The next chapter of research will present the main findings of the data.

Chapter 4: FINDINGS & RESULTS

4.1 Introduction

The data analysis phase of the research work is designated into a distinct research chapter comprising different sections for analysis of the survey data findings as well as discussion of the procured findings from the survey. This chapter holds importance in terms of showing the practical application of the incorporated method of data analysis.

Data Analysis is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense and recap, and evaluate data. According to Shamoo and Resnik (2003) various analytic procedures "provide a way of drawing inductive inferences from data and distinguishing the signal (the phenomenon of interest) from the noise (statistical fluctuations) present in the data". Indeed, researchers generally analyse for patterns in observations through the entire data collection phase (Savenye, Robinson, 2004). An essential component of ensuring data integrity is the accurate and appropriate analysis of research findings.

The study gives us an insight into factors responsible on the impact of academic performance of university students post Covid using e-learning mechanism. This study helps in determining the factors that were responsible and can be taken into consideration to enhance the satisfaction level and performance of students in online learning. It also helps in building a foundation that provide guidelines for future research in studying the impact and proposing corrective measures.

The data analysis chapter represents the graphical presentation of the survey outcomes of 91 students' responses from varied domain of the university. In the end, a summary of the important data findings is also provided in this chapter.

4.2 Survey-Data Analysis

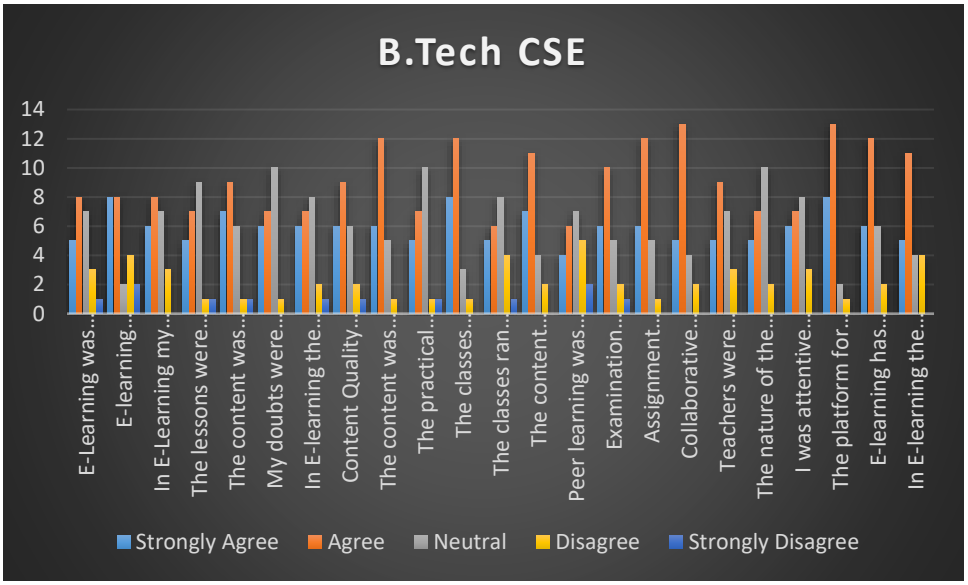
Out of the 91 participants from an education prospect 44 (48%) were undergraduate students and 47 (52%) were post graduate students. The majority respondents were post graduate (52%) in comparison to the undergraduate (48%). Respondents of various streams and disciplines are presented in Table 1.

Education	Frequency	%
Undergraduate	44	48
Postgraduate	47	52
Stream	**Frequency**	**%**
Sciences/Engineering	65	71
Arts/Social Science	2	2
Commerce/ Management	22	24
Physiotherapy	2	2

Table 1. The profile of respondents who participated in the questionnaire.

Data Analysis of Computer Science and Technology students

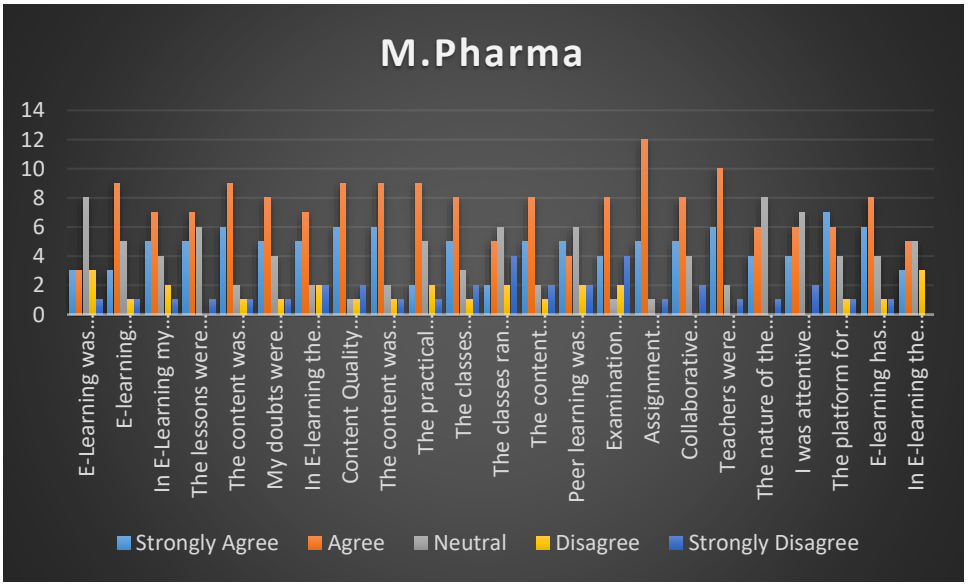
The results in Graph 1 shows the impact on academic performance of B. Tech computer science and engineering students during post Covid using e-learning mechanism during COVID. It also reflects that in Computer Science and engineering the peer learning, student engagement and network created a lot of issue in terms of understanding and performance. Also, student's doubts were not cleared, and the practical exposure was missing too. Thus, its reasonable to infer that the practical exposure in E-learning was not readily available through simulating software. Hence, has majorly impacted academic performance of students.



Graph 1

Data Analysis of Masters in Pharmacy students

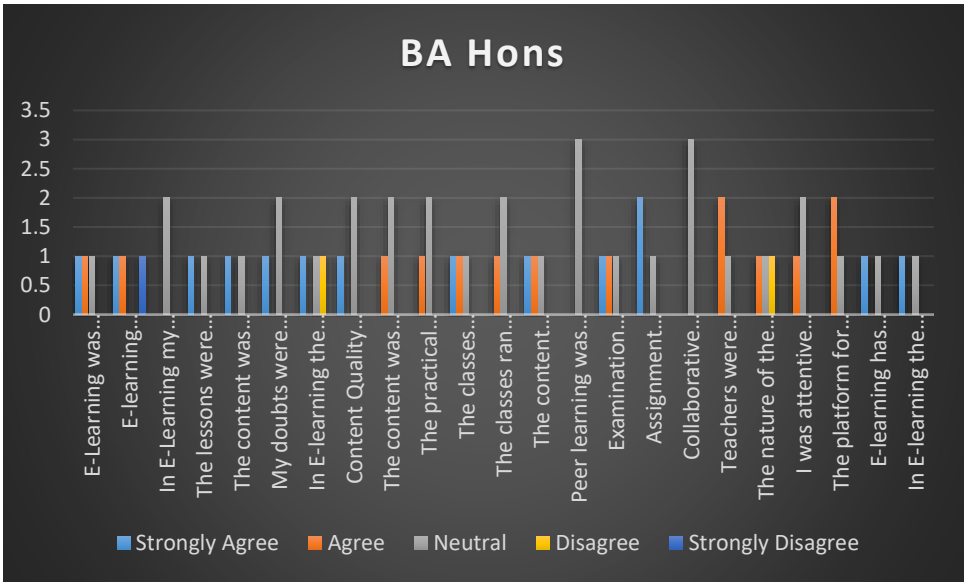
The survey data results that are represented in the below Graph 2 help in understanding that the prime reasons responsible for impacting academic performance were the network connectivity which also smooth examination conduct and in turn lead to significant impact. Thus, with the help of the survey responses, it can be interpreted that the prime reason responsible for impact on academic performance was network connectivity followed by the content downloading also impacted the preparation of the content.



Graph 2

Data Analysis of BA (Hons) students

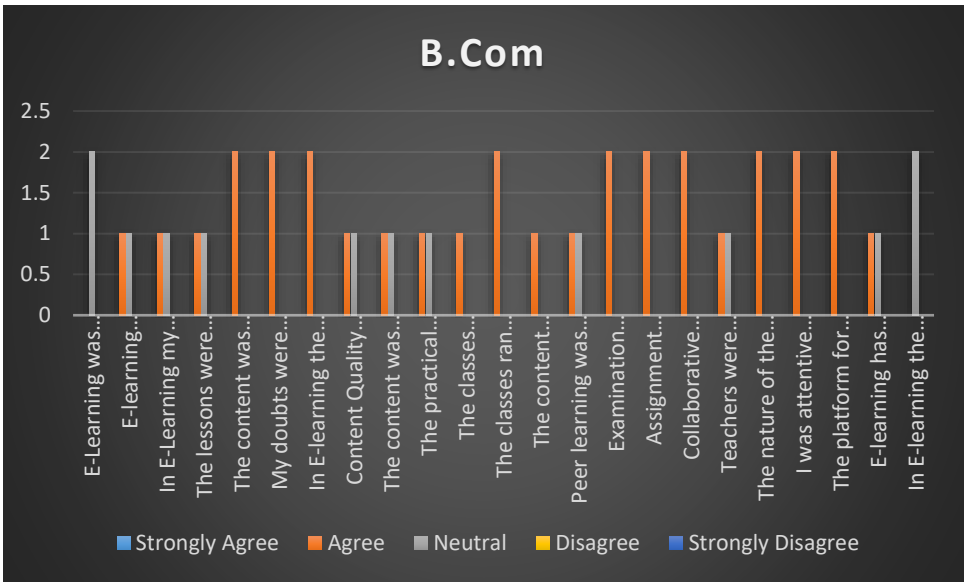
The survey results in Graph 3 illustrate impact on academic performance of BA (Hons) students during post Covid using e-learning mechanism during COVID. In this context, it is evaluated that majorly the nature of the course was not for e-learning. Also, the unavailability of the teacher for approaching for doubts did not encourage the students to go for self-study which tremendously impacted the students performance. Therefore, the data findings suggest that the course needs to be made more engaging from a student prospect on e-learning platform. Also, student reach in terms of teacher availability needs to be there for which some collaborative platforms can be used including peer activities to address the concern.



Graph 3

Data Analysis of B.com students

From the statistical results of Graph 4, it follows that B.Com students had a fair acceptance for the practical exposure , peer learning and engagement on the E-Learning platform , which impacted their academic performance. Therefore, the results lead to interpret that Covid19 is having a negative impact on performance of these students as the nature of the course requires mathematical practice, hence , more of the collaborative platforms with peer practice is needed to enhance the performance while using e learning platforms to make it more engaging.

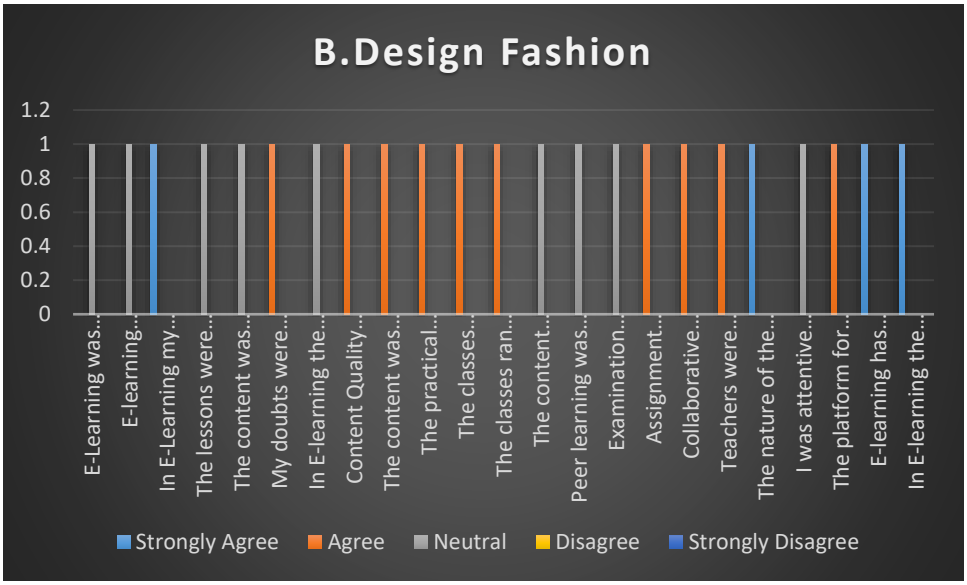


Graph 4

Data Analysis of B. Design (Fashion) students

The data results in Graph 5 helped to understand that B. Design students have shown minimal acceptance related planning of the lessons on e- learning platform which did not encourage the students to go for self study. Moreover, teachers were fairly approachable , it also lacked peer learning during delivery. Even the students lacked to show attention during the delivery of the course on e-learning as a medium. Even the examination conduct was not that smooth

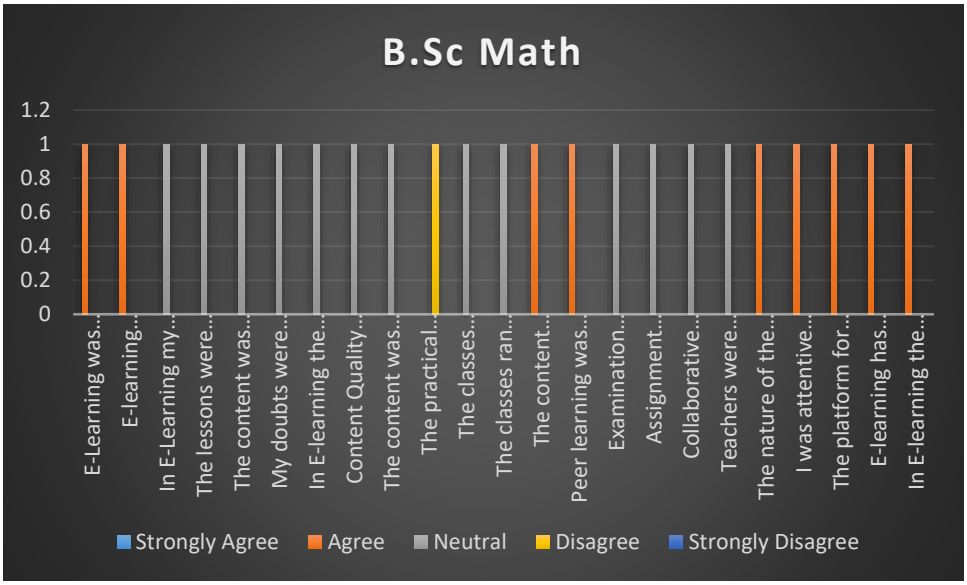
on e-learning mode. Statistical survey data revealed that this course was less interactive and failed to gain students attention during pandemic. Thus it is reasonable to infer that the course needs to be made more interactive so that it grabs the attention of the students.



Graph 5

Data Analysis of B.Sc. Mathematics students

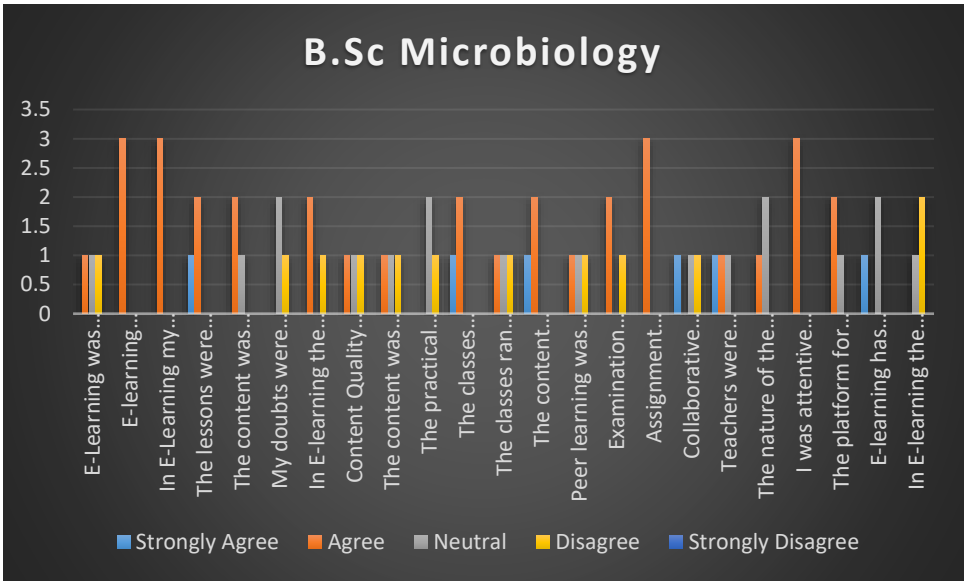
Referring to the below Graph 6 it can be inferred that primarily the practical exposure in E-learning was not readily available through simulating software which drastically impacted the academic performance of the students using e-learning during post Covid phase. Contrary to that it can be seen that disinterested responses were received from the students in terms content quality, the readiness of availability, smoot conduct of classes on network, usage of collaborative tools and teachers being technically equipped on e-learning platform. Overall, it can be stated that the major factor that impacted the academic performance was the practical exposure for numerical calculations. Thus it is reasonable to deduce that the simulation or emulation platform something equivalent in practical exposure needs to be a part of the course.



Graph 6

Data Analysis of B.Sc. Microbiology students

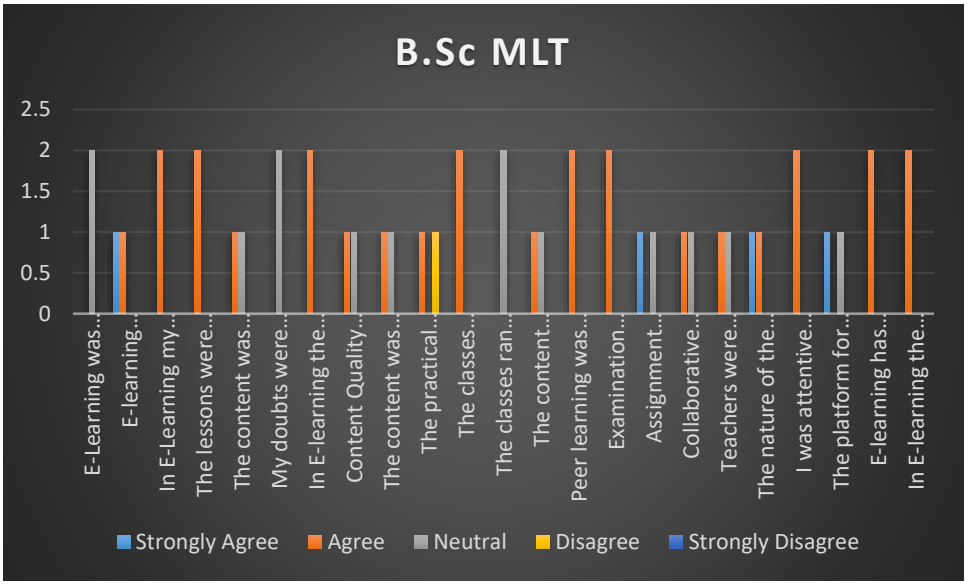
The survey results in Graph 7 illustrate that for microbiology students there were several factors that hindered their learning on E-Learning platforms and severely impacted their academic performance post Covid. Some of the prime factors were that their doubts were not cleared due to the approachability of the students . E - Learning platform was not easy for them and the practical exposure was missing. Their learning was impacted as the collaborative tools were not used . It can be deduced that the engagement was missing in e-learning mode. Thus it can be presumed that the e-learning platform needs to be made more interactive inclusive of collaborative tools with more of peer practice. Also, simulation software needs to be part of the course for regular practice.



Graph 7

Data Analysis of B.Sc. MLT students

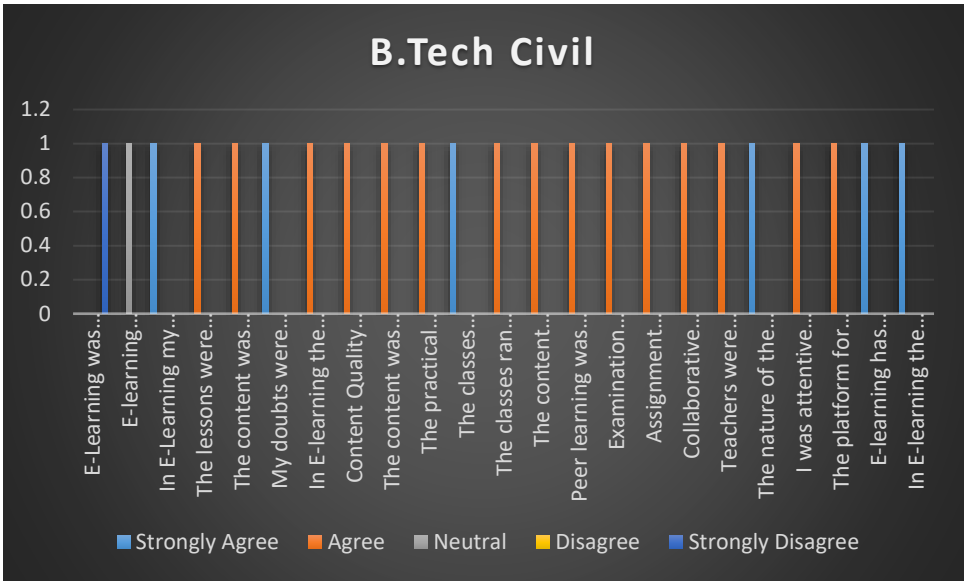
It can be inferred from Graph 8 that for medical laboratory students the practical exposure in the labs suffered during E learning which impacted their performance during Post COVID a lot. Moreover, bland responses were received in which students did not find the course easy to understand on a e-learning platform. It can also, be seen that the opportunities to clarify the doubts on a e-learning platform were not huge. Even, the network disruption caused hurdles to download the content from the network. In addition to it the network also posed problems in uploading assignment during e-learning platform. Thus it can concluded that the e-learning platform needs to be made more engaging and additionally the tools should have ready access of the trainers where the students can approach for clarifying the doubts.



Graph 8

Data Analysis of B. Tech (Civil Engineering) students

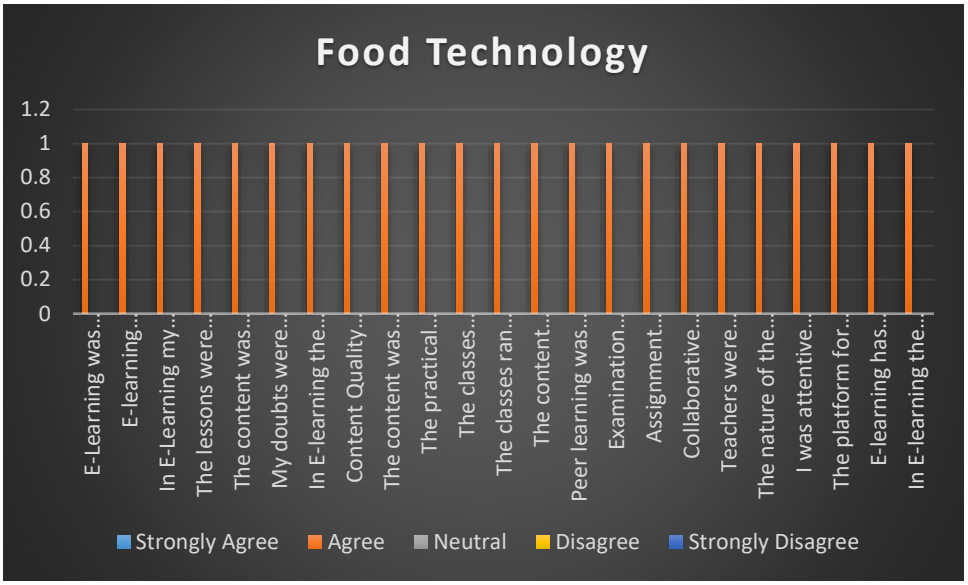
It can be presumed from Graph 9 that B. Tech (Civil Engineering) students didn't find e-learning easy to understand which failed to spark the student to go for self-study which in turn impacted their academic performance post Covid. Thus , it can be surmised that the platform needs to be made more collective, bilateral and more facile to gather the attention of the students.



Graph 9

Data Analysis for B.Tech (Food Technology) students

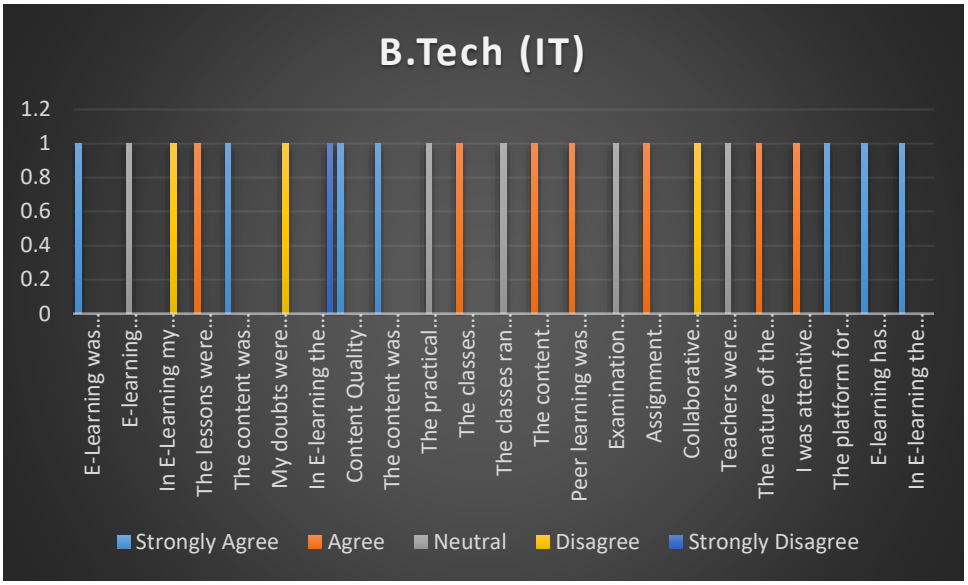
The survey analysis of B.Tech (Food Technology) depicted in Graph 10 reflects they were pretty satisfied with the e-learning as a platform. They did not found any challenges in their academic performance during post Covid. All the factors mentioned were found satisfactory. Thus, it can be interpreted that the students enjoyed learning on the e-learning platform and were able to reflect the same through their academic performance.



Graph 10

Data Analysis for B.Tech (IT) students

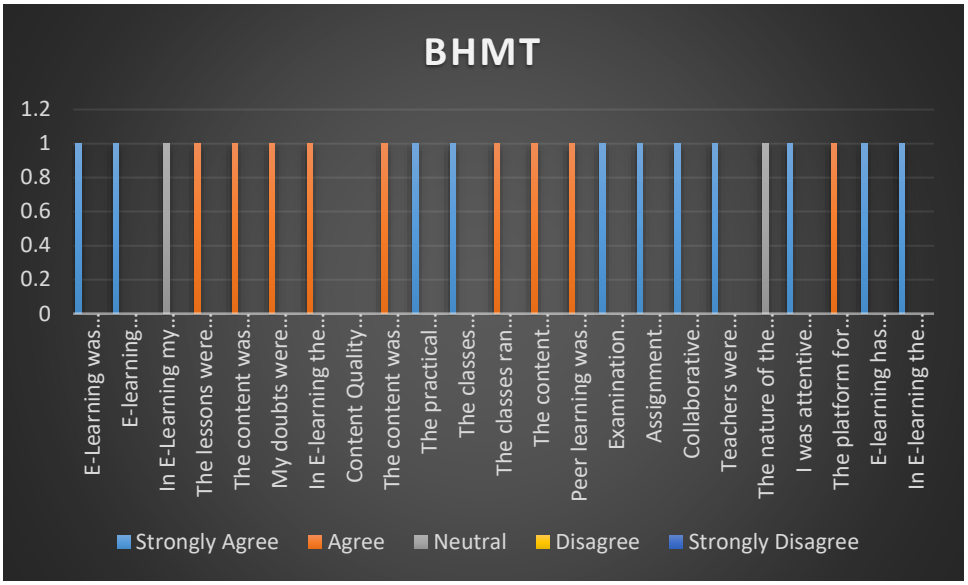
It can be presumed from the survey analysis for B.Tech (IT) students represented in Graph 11 that the approachability of the teacher was found the prime reason for having negative impact on the academic performance of the students post covid. Additionally, timely checking and feedback by the teachers, clarifying of doubts on e learning platform and inability of collaborative tools were others factors responsible for impacting the students' academic performance. Thus, it can be derived that the tool needs to be more collaborative and approachable in terms of doubts clearing and addressing the queries of the students.



Graph 11

Data Analysis for BHMT (Hotel Management & Tourism) students

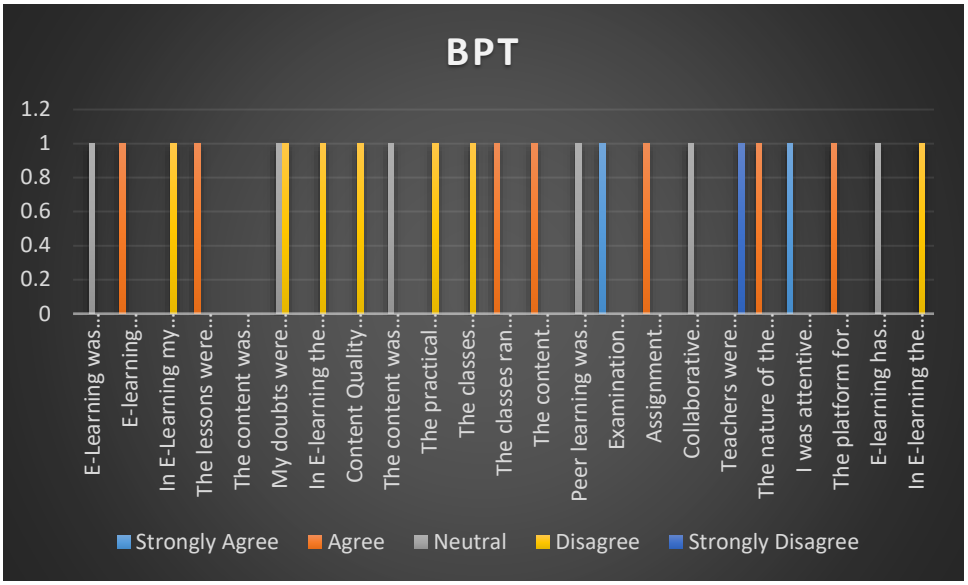
The survey responses of hotel management and tourism students as reflected in Graph 12 showcases that the students did not find the nature of the course for e-learning as it requires practical exposure. Also, there was a delay in checking of the assignment which also delayed the feedback. This had a significant negative impact on the academic performance of the students after pandemic. Thus, it can be presumed that the simulation software can be used with practical videos related to the course to make it more relatable on a online platform. Even some of the assignment can be made on the quiz mode to give the feedback instantaneously.



Graph 12

Data Analysis for BPT (Physiotherapy) students

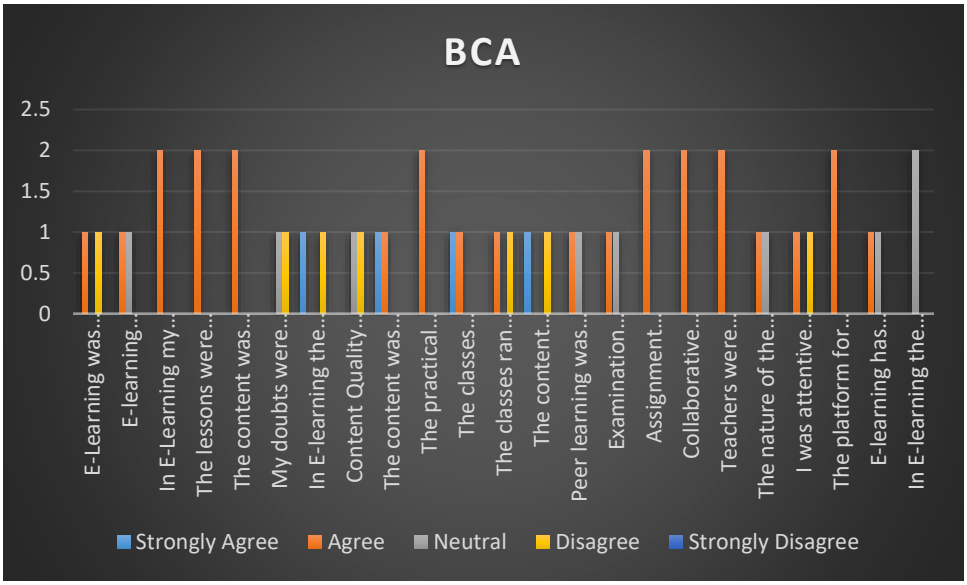
The response analysis of Bachelors in Physiotherapy students in Graph 13 infers that the students faced challenges in doubt clearing and were lacking feedback on the assignments submitted. Also, the teacher was not approachable due to restrictive timings. The practical exposure suffered in getting trained for physiotherapy course. The teachers were finding a lot of challenges with the E-Learning platform usage. This negatively impacted the academic performance of the students tremendously. Thus, the inference that be drawn is to make the tool available for clarifying the doubts beyond classes. Even, the teachers can be given regular training on making the platform engaging and collaborative.



Graph 13

Data Analysis for BCA students

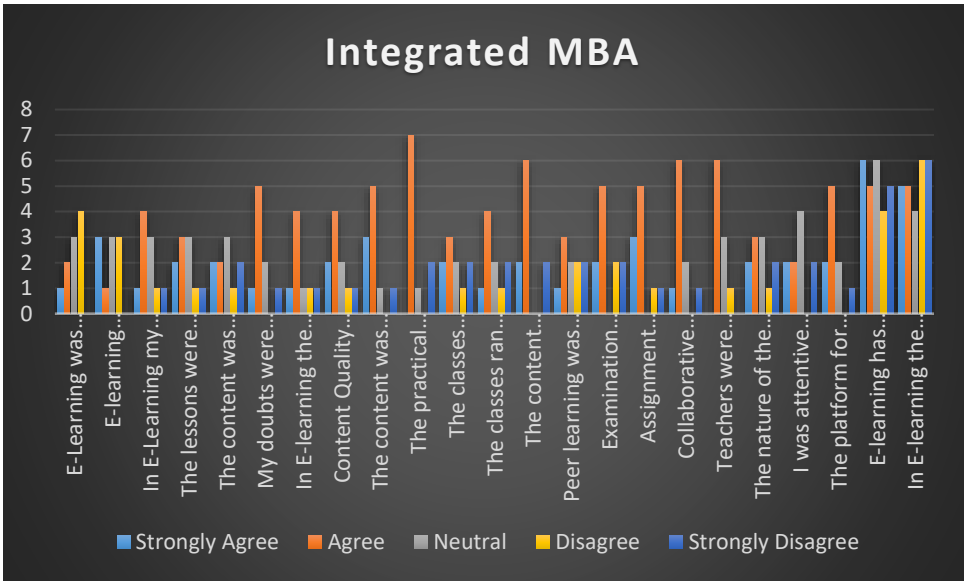
It can be concluded from the response analysis of computer application students as reflected in Graph 14 that in computer applications the content quality was hampered in e-learning and was not upto the mark, additionally, the network created lots of issues while downloading the content. This in turn impacted the attentiveness of the students which impacted academic performance of the students significantly. Thus, it can be assumed that the lessons can be made available at self-paced mode too, so that the students can watch the recordings later due to network disruption.



Graph 14

Data Analysis for Integrated MBA students

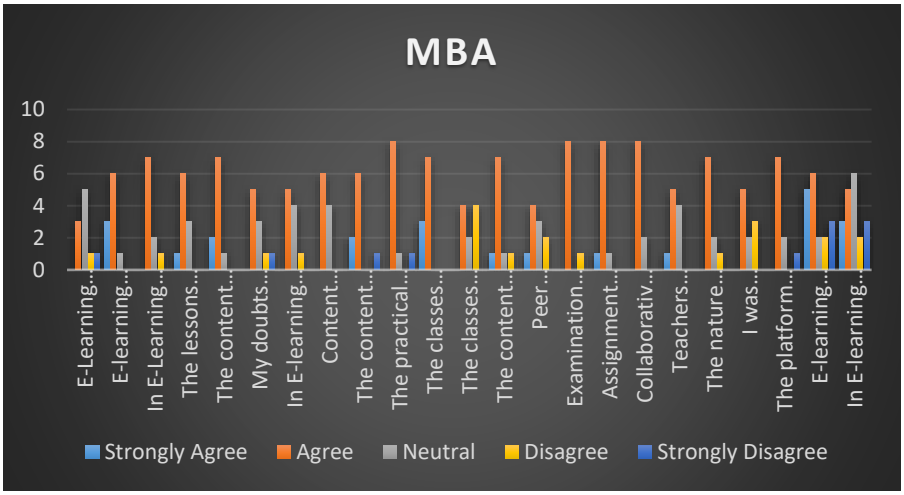
It can be summarized from the survey responses of Integrated MBA students in Graph 15 that the academic performance was impacted the most as the students were struggling with doubt clearing session as the teacher was not approachable. The internet network issue did not let the classes to run smoothly and on time. The peer learning was a great challenge as the engagement was not adequate in E-learning platform. Hence, it can be presumed that the interface for doubt clearing to be available beyond class hours. Also, to incorporate collaborative tools for peer learning and the recordings of the session to be made available post classes as well.



Graph 15

Data Analysis for MBA students

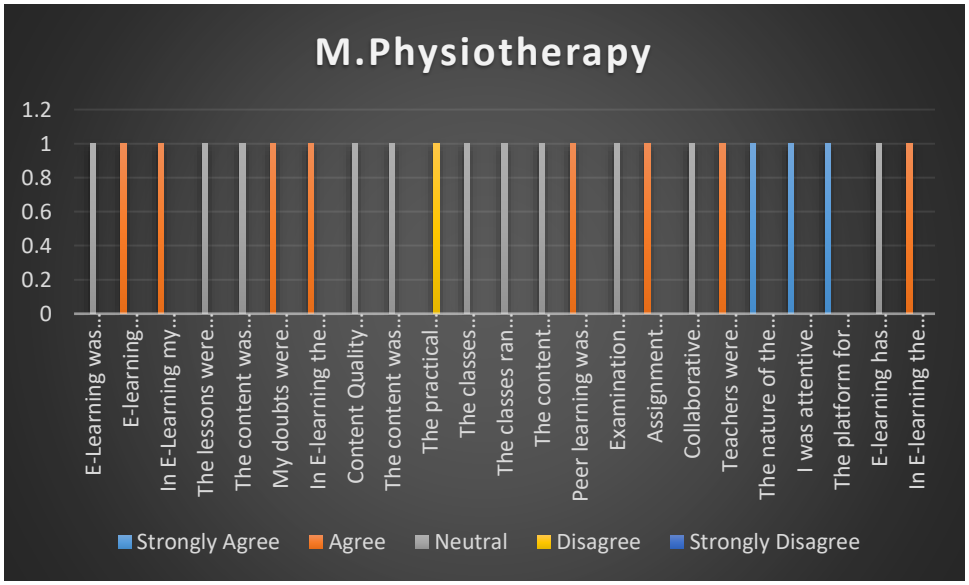
A thorough analysis of the survey responses for MBA students in Graph 16 induces that there were multiple factors that affected the academic performance post covid while learning on E-learning platforms in MBA as one being the readiness of the content availability. Moreover, the doubts clearing of the students was impacted too. Also, the practical exposure in industries was missing which didn't allow practice of skills. Engagement was another challenge on the e-learning platform. Thus, it can be surmised that the recordings of lesson to be available post classes and the tool to allow teacher-student interaction post classes for clarifying the doubts.



Graph 16

Data Analysis for M. Physiotherapy students

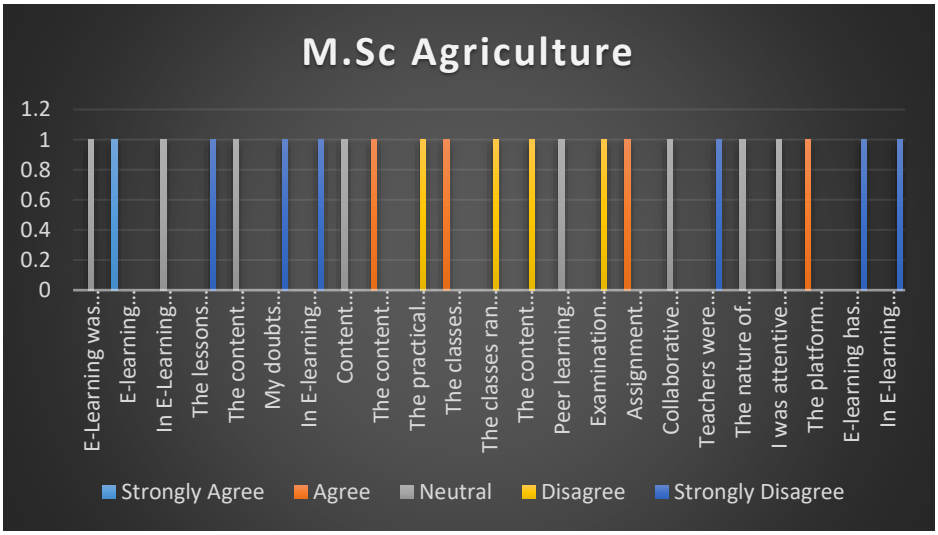
The inference that can be drawn from survey responses of Masters of Physiotherapy students in Graph 17 is that the major factor which impacted the academic performance of the students in MPT was the practical exposure of physiotherapy which suffered during e-learning and hence students lacked practice. However, there was a bland response in terms of content quality, lesson planning, smooth conduction of classes on e-learning platform and improvement of academic performance during e-learning mode. Thus it can be extrapolated, that simulation software can be used to provide real time practical learning.



Graph 17

Data Analysis for M.Sc Agriculture students

While drawing the inference of survey responses for M.Sc Agriculture students as reflected in Graph 18 some of the key factors which impacted the performance of the students' in M.Sc. Agriculture post covid were the lesson planning, approachability of teachers which in turn impacted the doubt clearing. Also, class engagement was another challenge observed, furthermore teachers struggled with the e learning platform usage which impacted the academic performance of the students. Thus, it can be surmised that availability of the teachers on e-learning platform post classes could help in doubt clarification and the usage of collaborative and interactive platform to boost class engagement.

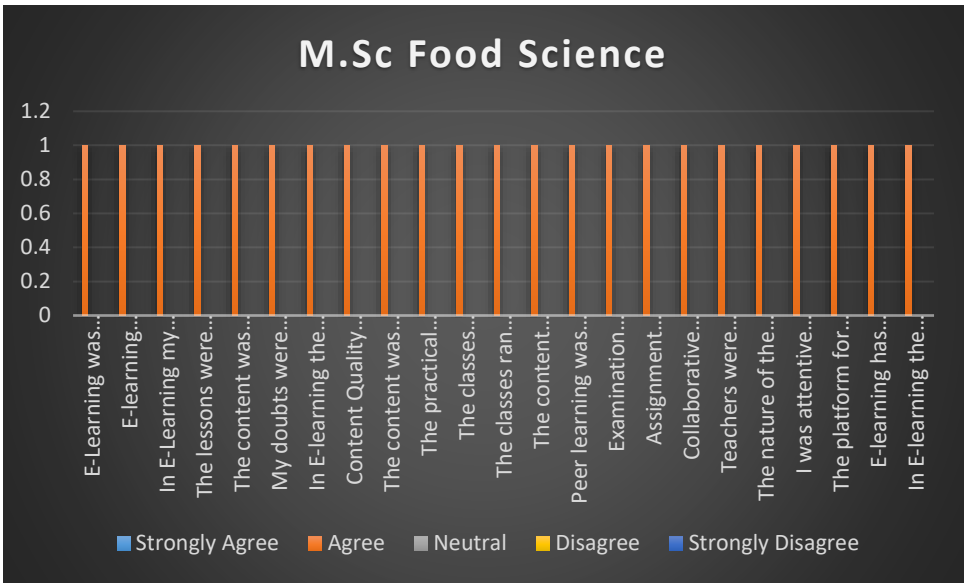


Graph 18

Data Analysis for M.Sc. Food Science students

From the survey response analysis of M.Sc. Food Science students as shown in Graph 19 it can be assumed that e-learning had a satisfactory impact on the performance of the students

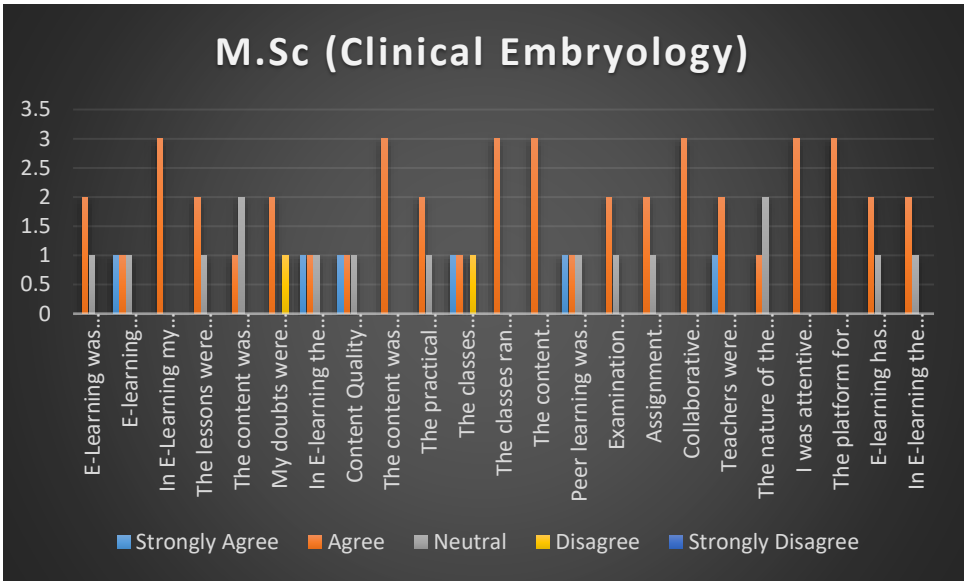
with all the survey questions raised. Thus, it can be inferred that the e-learning platform was able to meet the expectation of the students and was found satisfactory.



Graph 19.

Data Analysis for M.Sc. Clinical Embryology students

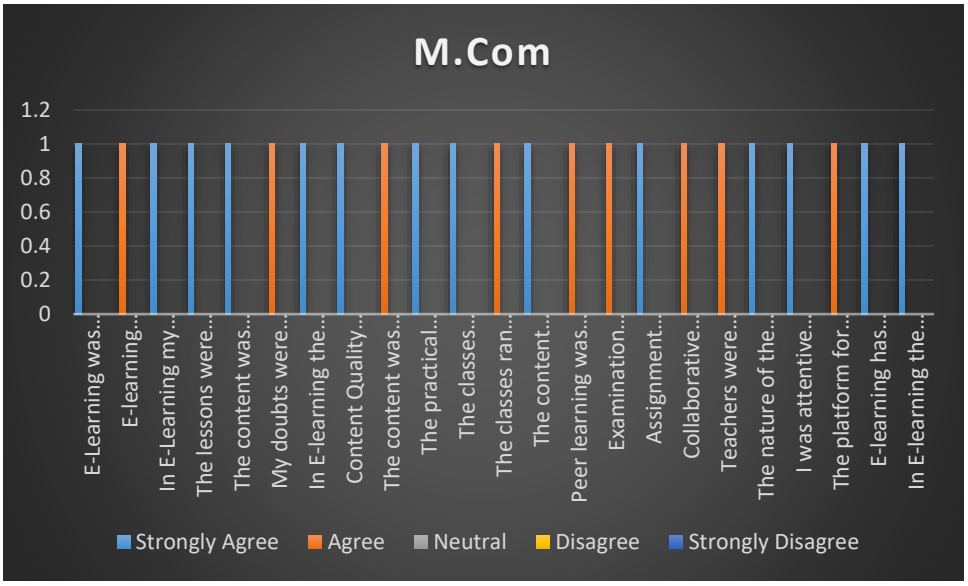
The below survey response analysis for M.Sc. Clinical Embryology in Graph 20 represents that there were 2 main indices for M.Sc. Clinical Embryology which has impacted the performance of the students' post COVID i.e. doubt clearance sessions and the classes start timings. In addition to it, students had neutral response towards course content quality, availability of the course on self-paced mode , conduct of examination and uploading of assignment. Thus, it can be concluded that an active platform for clarification of doubts post classes is required and also if a reminder for class start time to be integrated in the tool to provide prior notification.



Graph 20

Data Analysis for M. Com students

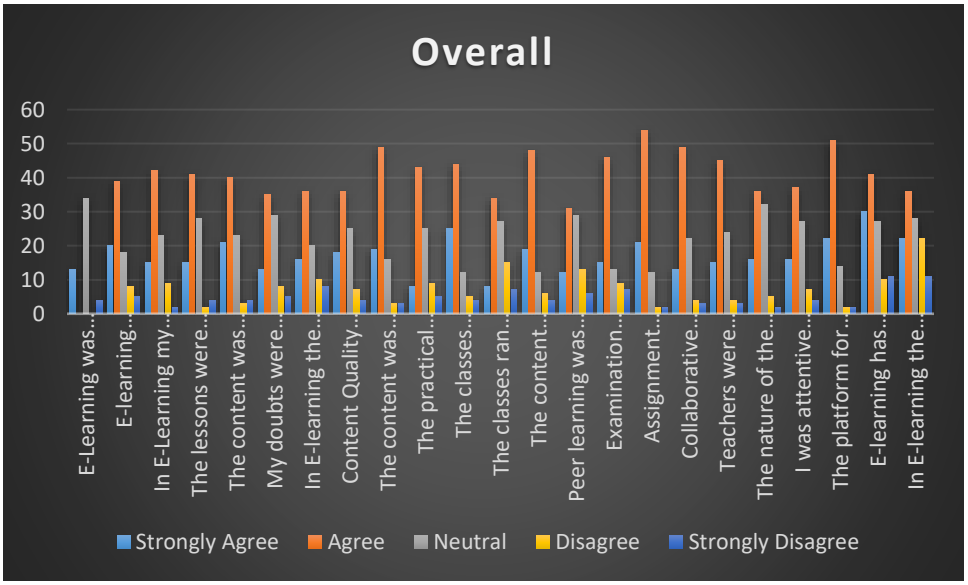
It can be observed and interpreted from the survey response analysis of M. Com students that the impact of e learning has been very minimal and negligible on the performance of M. Com students after pandemic. Hence, students are pretty satisfied with the e-learning and its impact on academic performance.



Graph 21

Overall analysis of factors impacting academic performance post pandemic using e-learning

Considering all the above stated detailed courses it can be inferred on the basis of survey responses as shown in Graph 22 that overall teacher approachability, class engagement and peer learning were significantly impacted which affected the overall performance of the students. Thus, it can be concluded that the interface for making teachers available post class hours can be integrated and also inclusion of collaborative platforms to make it more engaging.



Graph 22

Chapter 5: DISCUSSION

This study aims to examine the impact on academic performance of university students post Covid using e-learning mechanism during COVID and ways university can manage the challenges to enhance the academic performances.

The first aim of the research is to examine the challenges that were faced during e-learning which impacted the performance of the students post covid. The COVID-19 pandemic forced the entire world to make drastic changes in the way the education needs to be imparted. In order to ensure the minimize spread of these pandemic multiple alterations were done to the current system of education. This led to change of experiential learning to e-learning with the use of technology.

This study was successful in identifying the factors that impacted the academic performance of the students post COVID using e-learning mechanism.

The first aim of this research is to examine the factors that impacted the academic performance of the students post COVID using e-learning. Hence, it can be argued that no matter the institutions switched to online learning platform to avoid loss of study but there were tremors that were observed in the academic performance in the post COVID world. Here is the detailed discussion about the factors that impacted the most.

Teachers' approachability: on e-learning platform led to unclear understanding as the doubts were not getting cleared within the stipulated time of e-learning. The tool being used in the university was MyClass as a platform developed by Code Tantra. The classes were scheduled on this interface in a manner that after 1 hour automatically the class ended and automatically the student/teacher has to login for the next class. This left no opportunity for the student to clarify their doubts. Though, LPU Live chat was available a chat interface but the face to face or vocal interaction was missing on the platform for seeking clarification. Thus, tools with easy access of the trainer can solve the purpose

Class Engagement: This was minimal as majority of the student were not getting monitored while joining for the session and hence, lacked supervision. Also, the platform only had polling as an option to be used to get an idea of student understanding. The platform should have a proctored approach throughout.

Peer learning: was restricted in e-learning Nonetheless, the isolated approach of e-learning made it difficult to comprehend the details with their peers due to restricted mode of e-

learning. Especially students were sitting in their own silos only virtually they were seeing each other during class timings but off the class social interaction was totally cut off. Thus, they were unable to clarify the doubts among each other too. More of the collaborative software with participation across the class can solve the case.

Internet Connectivity: Due to this issue the students were getting disconnected a lot of times due to which the clarity of the content was not upto the mark. The platform being used by the university student was MyClass through CodeTantra which required 500 Kbps of speed to upload and download the content. This also made the assignment submission difficult at times to upload. The platform can have varied band width to support the purpose.

Technology Equipped Teachers: Since the onset of COVID was unimaginable hence the previous rote techniques used were limited only to PPT and white board. However, the need of the hour was to have tech savvy teachers to support the e-learning platform. Hence, this gap failed to spark learning amongst the students since both were on the learning phase of getting adapted to the new interface. Becoming habitual to the platform required time and in between this also led to wastage of time.

Supervision of students : Though COVID provided an ease of learning to the students from home but at the same time was not being taken seriously by the students. As most of the times the students joined the classes for the attendance purpose but were not even listening to it . This increased the horizon of doubts which reflected clearly during their evaluation post pandemic.

Learning environment: Despite the fact that students were instructed to be alone in the room while attending online classes but majority of the times the students lacked to fulfil the right environment needed for the study. Maximum times during conduct of the classes background noise and household conversation served to be the major source of distraction. This deviated mind process failed to gain the focus of the students.

Behaviour of students: Somehow during the COVID phase the students became non serious while attending the classes. The basic reason that can be held responsible as the students were given an option while login either to login through microphone or through camera microphone. Even the university guidelines clearly stated that the student has to login with camera and microphone both still they clicked on only microphone. Thus, this non serious approach of the students affected their studies a lot which was well noticeable post COVID.

Additionally, students were found requesting their siblings or cousin to login on their own behalf.

Class control: It became difficult to manage the classes during the COVID phase by the teachers as maximum time the students unmuted and their personal talk can be heard in between the classes. Since, the class that logged in at one moment was huge , despite of warning , the time was wasted in between putting the student on mute mode. Hence, the class decorum suffered a lot during the ongoing lecture which impacted their understanding. Thus, in fully-online mode one requires a significant amount of discipline and motivation to be successful at it (Golladay et al., 2000; Serwatka 2003).

Motivation among students: Motivation is another factor that enhances e-learning, as some of the students were not accustomed to this stationary and isolated mode of learning which made them aloof for hours at a given place raising boredom amongst them, this is because if students are motivated to learn for one reason or the other this encourages them to persist in the face of difficulty in order to attain their goals (McKeachie, 2002, p.19).

Online evaluation: During online evaluation a lot of students, plagiarized the content or even in speaking evaluation were found using internet as a medium to refer while speaking. This unauthentic approach hit the students badly post COVID which significantly impacted their performance as their proctored approach did not give them an opportunity to copy paste the content in between.

Parents Support : It was also noticed that during the conduct of online classes the parents too didn't take it seriously and were found sending students for their personal task in between the classes. They took online mode only as a means of listening to the content. At points, the students were found handling their own business or managing household tasks during the conduct of the class. This distracted approach impacted the students' performance badly post COVID as some of the topic they were not even aware about.

Resource Availability at home: During conduct of the classes in the university the Wi-Fi access is provided to all the students free of cost. However, though to address the need of the hour the entire mode of teaching switched to online mode but some of the students being from rural areas could not match the pace and occasionally suffered during the conduct of online classes for which they have to move from their own village to different cities.

Ease of understanding: There are varied categories of learners like visual, auditory, kinaesthetic, and reading/writing. Though in COVID the entire module of learning shifted to online platform but again were not able to meet the requirements of kinaesthetic learners which needs hands on practice for learning.

Lesson planning: Since the university was following the same set of instruction plan that was being followed offline thus the teaching pedagogy also required certain changes in the delivery. In addition to the MyClass as a platform other platform that were being used were G-Meet, Zoom etc. Thus, in lecture too more of technology integration was required. Eventually the video that can be shown to the student in between delivery was only YouTube video as a link. However, other recorded videos cannot be played on the platform. Especially, the field work suffered a lot during the COVID phase.

Inconsistent Power Supply: In some of the state's due to intermittent power supply the power cuts impacted the lectures and the tutorial understanding. Majorly, in May and June, in the midst of the outbreak of COVID-19 India experienced two major cyclones. On May 20, super Cyclone Amphan hit the east coast of India, West Bengal and Odisha and parts of Bangladesh. On June 2, Cyclone Nisarga on west coast hit Maharashtra. Thus, the students from these states were impacted the most as their assignment and evaluation suffered too.

Examination conduct : The only mode of examination that was available in the online learning was the proctored mode. While proctoring of the students, due to internet challenges the video of the students was not available on the MyClass platform. In majority of the situation, the student did not turn on the video while appearing for the examination and thus closed it on video off mode. In between it was also observed the chances of swapping the windows were maximum as frequently the interface raised the alarm wherein the candidate was trying to cheat. In case of written examination, the students need to upload the picture of the written paper which was also experiencing a challenge as they were not able to upload due to internet connectivity issue. It was also observed that maximum students were not able to complete the exam within the timeline and the portal closed automatically when the time ran out.

Psychological impact on students: It was quite evident that COVID-19 created a hostile environment where some of the students were stuck in university hostels, some were infected and others in constant touch with their family on phone. The terror of loosing and worrying about the family members was a constant threat that was pondering students thought. An

untimely call from the family was like sweat running down the forehead. Everyone was more concerned about what was happening the next door in terms of health. This deviated their minds from concentration towards their studies. Students were found struggling to maintain concentration in studies. The ones on their way back to home were quarantined on reaching their respective states and thus haltering their studies altogether. This midway struggle between life and ongoing education was hampering them psychologically. Even the ones at home could not centralize their concentration even among family members as there was a panic situation all over. This significantly surged anxiety and depression cases which not only affected the students mentally but also academically. There was notable effect on students' daily routine leading to emotional changes and reduction in physical contact. One of the major contributor of anxiety amongst the final year student was fear of getting job as the labour market was impacted due to this pandemic too. Another factor which was mentally impacting them during COVID was bearing fees as somehow parents' job was impacted during COVID. Online learning deprived them of social bonding that students had in their classes and the support they had in terms of understanding the subject from teachers and peers. Not everyone in the class was adept to an online learning mode which hampered them psychologically a lot. Their anxiousness was well reflected through their constant queries of learning resuming back to the classroom mode. Somehow, e-learning was not able to pacify and resolve their queries to an extent of their satisfaction.

Flexibility of the students: Since, majority of the students were adapted to the traditional mode of learning ,hence, online learning created stress for them and were not able to understand. Also, the screen time increased due to which the students were finding the online learning to boring and monotonous.

Pedagogy available and used for face-to-face learning is not reasonable for online learning. Though an extended mode of pedagogy has been devised for online and distance learning, teachers who are technologically primitive require proper professional development and training in order to orient themselves towards their students. Authentic assessments and timely feedback are essential elements of learning. A very crucial part of online distance learning is the availability of helpful formative assessments and timely feedback to the online learners (Doucet et al., 2020). This is found to be challenging for the educators and the education system.

The literature finding also support the above discussion that during pandemic though e-learning as a platform was given to ensure distant learning but it lacked monitoring and assisting strategies (2022 Amer H, et al.). Even in case of certain urban and rural areas the internet connectivity was a challenge which made the content less readily available and even for the assignments to get uploaded. The closure of academic institution led to further inequalities in terms of access to technology. This also lacked motivation amongst students due to isolated mode of teaching. Eventually at times the faculty was found struggling with the platform too as they were not technically equipped.

Asynchronous Learning: This type of e-learning has its limitations to the technical training as it does not involve the real time interaction between the learners and the trainers and also restraint them to practical exposure. Thus, students involved in technical courses faced a difficulty in terms

Summary

The central aim of the research was to identify the factors that impacted the academic performance of students in Lovely Professional University post pandemic in an e-learning environment. The results derived from the survey showed that the students in the university faced various challenges during e-learning which impacted their academic performance. These challenges include, lack of practical exposure, inability to clarify doubts, feedback of their assignment and internet connectivity challenges that overall impacted their academic performance. Findings also revealed that e-learning was not found engaging and the students were unable to collaborate with their peers.

Therefore, new ways to make e-learning more interactive and engaging can be inculcated so that students find it easy to understand. In addition, various aspects like more of student teacher engagement to clarify the doubts and even self-paced courses can be created. This summarizes these new ways of inclusive and collaborated during and after COVID has a strong impact on an educational institution.

Chapter 6: CONCLUSION & RECOMMENDATIONS

This research has been done on students at Lovely Professional University across domains and does not cover students from other universities to get a competitive advantage. Despite the limitations, the findings offer an understanding of the advantages, limitations, and recommendations for improvement in online learning, which is the need of the day.

6.1 Conclusion

The aim of this research was to study the impact on academic performance of Lovely Professional University students post covid while they studied in e-learning mode during COVID. The primary goal of this research is identifying the factors that impact the academic performance of the students. With this support the data results concluded that several factors were responsible which impacted the students' performance after COVID when they studied in e-learning mode such: teachers approachability, class engagement, internet connectivity and peer learning. Regarding the second objective, however, the survey results, supported by literature-based knowledge, have clearly established that the challenges defined above could be overcome by the emergence of new ways of working by incorporating and inclusive and collaborated teaching after the COVID19 pandemic.

To sum up the findings of the paper, it is found that many studies in the past has highlighted the impact of Covid 19 on the educational system which unfolded various problems thus impacting the online mode of education. In order to ensure safety though lock down was imposed but it affected the learning of the learners thereby swapping the mode of learning from traditional to an online mode. However, adjusting to this online mode though the education system and the families engaged students online, but not all the students carried the required skill set, knowledge and resources online. Hence, during this drastic shift to an online mode the entire education system was dependent on stable internet connection with high bandwidth which affected the students residing in the rural areas. It was quite evident that the even the evaluation was impacted due to this online education demand.

Thus, the institution can adopt new ways of collaborated learning to address the factors affecting the academic performance.

5.2 Recommendations

- Training should be organized for the teachers to make their learning more interactive on the e-learning platforms. In between the content the quiz can be conducted in an interactive manner using platforms like Kahoot, Nearpod etc.(Kumar, Shiv Charan 2018)
- The content can be designed on the collaborated platforms like pear deck which makes the content more engaging and collaborative so that even on e-learning platform the students are able to practice peer learning.
- Even while assigning the document work it can be through shared platforms like google sheets, google docs or one drive through Microsoft so that the remarks can be seen in real time situation.(Pak J Med Sci. 2020)
- The lectures for the class can be created in self-paced mode so that the students can watch it anytime.
- Low band width option for watching video lessons should be there to address the network connectivity issue.
- Simulating and emulating software's to be used wherever the practical and experiential learning involved so that the students should have a real time understanding of the situation.
- Online education has expected many organizations to swap from the traditional face to face education to e-learning mode. However, this dynamic change should also acknowledge the variance of students background as many of the students belong to villages where internet connectivity along with technology is a challenge. It is quite evident that the students will face multiple challenges in this transitioning mode as they vulnerable to internet access and other disadvantages (World Bank, 2020).
- Even in online and blended more of learning wherein the student encountered multiple technological challenges (World Bank, 2020)thus a support in terms of infrastructural requirements including hardware and software support systems (Ali, 2020) would be able helpful to ensure all the students are at the same pace and no one is left out.
- While designing the curriculum for online platform the curriculum review committee should ensure review of face to face material that are appropriate for online learning. Hence, ensuring that the content should not sound monotonous, non-engaging and resulting into reluctance towards learning (Chizhik and Chizhik, 2009, Negiri, 2013).

- In the COVID phase where there was a paradigm shift in the learning mode , hence, the assessment should also be in the form of creative projects using 3D modelling, blogspot journaling, and so on (Ali, 2020, Gipps and Stobart, 2003, Lavy and Naama-Ghanayim, 2020). These forms of assessment will acknowledge the transformational needs during COVID phase and hence would be a right measure for evaluating students performance.
- Performance evaluation in terms of scores serves as a motivational factor to gain students attention and engagement. Thus, may be a change in the score evaluation during online platform can help in gaining students attention.
- In order to ensure quality results during evaluation , mock online examinations could have been provided to the students in order to ensure that the students had enough exposure before sitting for the actual examination.
- Online programs should be crafted in a manner that they are creative, interactive, relevant, student-centred, and group-based (Partlow & Gibbs, 2003).
- Reliability and sufficient accessibility of Information Communication Technology infrastructure, learning tools, digital learning resources in the form of Massive Open Online Courses, e-books, e-notes, and so on have grave importance in such severe situations (Huang et al., 2020).
- Hybrid learning can be the futuristic learning that combines the face to face learning with online learning (Allen & Seaman, 2003) e.g in this mode of teaching, teaching and exams are done offline , however, the assignments and presentation are done online. It is further suggested that 80% to 90% of all courses will be done through hybrid learning (Allen & Seaman, 2003; Lorenzetti, 2005; Young, 2002). Furthermore, in the blended learning, flipped classroom technique is practiced, hence, students are allowed to read some of the course materials online prior to the face-to-face meeting, which allows the students to have a fair idea of the topic to be discussed in class (Smart & Cappel, 2006).
- In order to deliver quality education there are multiple certification courses that are available through the institutions like Cambridge University, British Council. The teachers can use these platforms and can make the training easier and more understandable.
- Simultaneously, the teachers can widen their horizon of learning through e-magazines, e-journals and e-library. Even audio and video conferencing can be used

to increase the domain of knowledge and ensure effectiveness of delivery.

- Even the teachers can mentor and guide their students to use e-books, e-journals, e-magazines and social sites which can help them attain the required skill set of their subject even during online learning.
- Even ICT gives an opportunity to study the curriculum of different universities across the globe and help them making necessary incorporation to increase the horizon of learning.

5.3 Future Research

The future research can also include the perspective of teachers. Also, the data is collected from Lovely Professional University only but if the data is collected across the countries, it can give us better comparative analysis from a student's standpoint. Another constraint is that this study is limited to checking the academic performance of students only thus in future may be the performance of the teachers can be checked under similar conditions. Some of the factors that can be included in the future research is home environment, parent's educational status, parent's knowledge in terms of technology and the bandwidth of the internet used at home and learner's demographic conditions. Thus, the above-mentioned points can be included in the future research.

Thus, in terms of future scope of research, this study unlocks the likelihood of carrying out studies that deal with anticipated factors that were talked about , as well as studies that suggest more factors impacting the academic performance of university students.

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Appendix

Questionnaire for Thesis

As a part of the research work, for each statement in the survey, please indicate how much you agree or disagree with each statement. There are no right or wrong answers. Your answers will be kept highly confidential and you will not be identified.

* Indicates required question

Email*

Your email

Program

Choose

E-learning has improved my academic performance post covid

Rating

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

In E-learning the engagement was better

Rating
Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree
Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree

E-Learning was easy to understand

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

E-learning encouraged me to do self-study

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

I can well understand the concepts in E-learning

Rating

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

In E-Learning my assignments were checked and feedback given within acceptable period of time

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

The lessons were planned very well in E learning

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

The content was available at self paced mode in E-Learning

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

My doubts were regularly cleared in E-Learning

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

In E-learning the teacher was approachable

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

Content Quality was great in E-Learning

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

The content was readily available in E-learning

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

The practical exposure in E-learning was readily available through simulating software

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

The classes started on time in E-Learning

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

The classes ran smoothly on the network

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

The content provided was easily getting downloaded on the network

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

Peer learning was great on E-learning

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

Examination conduct was smooth on E-learning

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

Assignment upload was easy on E Learning

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

Collaborative tools were constantly used for better understanding in E learning

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

Teachers were technically equipped with all platforms in E -Learning

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

The nature of the course was not for E-Learning

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

I was attentive on E-learning platforms

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

The platform for E-Learning was easy to use

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree