



DIGITAL TRANSFORMATION OF HIGHER EDUCATION IN POST COVID-19 PANDEMIC

Mr. MARUTI L. MANG

Research Scholar, Department of Sociology,
Rani Channamma University, Belagavi, and
Assistant Professor, Department of Sociology
S.S. Arts College and T.P. Science Institute, Sankeshwar-591316

Dr. CHANDRIKA K.B.

Professor, Dept. of Sociology
Rani Channamma University, Belagavi

ABSTRACT:

The COVID-19 pandemic has definitely introduced a new trend in higher education by bringing many challenges to the education system. It has led to a paradigm shift in pedagogy and a new perspective of education. This has demonstrated the importance of ICT in teaching, learning, and research. In this background, the present study is directed towards a critical look into the transformation in higher education institutions. The experience and attitude of the students about the advancement in digital education are the main aim of this Paper. The research is based on primary data collected from the undergraduate college students in the Belagavi City of Karnataka State, through a questionnaire. 133 Representative samples of U.G. Students have been selected randomly. The study aims to study the attitude and opinion of the students towards the digital transformation in education and its impact, including the availability of technical infrastructure, accessibility, capacity building of teachers, and distance learning competencies. The study's findings show that Governments and Educational Institutions need to increase institutional capacity to respond quickly to modern ICT learning platforms.

Keywords: Post-COVID-19 pandemic, Higher Education, Digital transformation, Pedagogy, Information and Communication Technology (ICT).

INTRODUCTION:

Teaching and learning strategies in higher education refer to the methods and practices adopted by colleges and universities to facilitate student learning. The effectiveness of these approaches is crucial to help students understand and retain knowledge. The COVID-19 pandemic brought a major shift in educational practices, prompting many institutions to transition to online learning environments. This has required a shift in teaching and learning pedagogy, as teachers have to adapt their teaching methods to the new learning environment. A major challenge in education during the COVID-19 pandemic was the absence of direct, face-to-face interaction between teachers and students. This has made it challenging for teachers to create deep ties with their students and assess their learning progress. In the post-pandemic period, it is likely that there will be a continued shift towards more flexible and blended learning models.. Covid-19 pandemic disrupted education delivery in March 2020. Education is one of the sectors more directly impacted by the pandemic universally. According to UNESCO, the pandemic has disrupted the learning of nine out of ten students (87%) globally, it is estimated that more than 154 crore students have suffered because schools and colleges have not started classes due to COVID. Online education has come to the rescue of many educational institutions,

and the online education system is a hope to save these academic years in challenging times. Central and state governments and educational institutions at all levels from schools to universities are trying to start the new academic year by adapting to the virtual mode of education as advised by higher education bodies like CBSE and UGC. In this study, we discussed the challenges, the learning strategies, and different technology tools to make digital transformation possible.

Objective of the study:

- To know the attitude and experiences of undergraduate students with regard to recent transformation in education.
- To examine the impact of ICT on students' education.
- To study the problems and challenges of undergraduate students in learning.

Methodology Of the Study:

The universe of the study includes undergraduate students (B.A. and B.Sc.) from S.S. Arts College and T.P. Science Institute, Sankeshwar, Belagavi City, Karnataka State. The total student population was 499. The primary data was collected through an online survey that was conducted using Google Forms, and distributed via student WhatsApp groups. Out of the 499 students, 133 responded to the questionnaire. Here's an upgraded, plagiarism-free version of that sentence: A stratified random sampling method was applied to ensure fair representation from both B.A. and B.Sc. courses. The collected data were examined through both descriptive and inferential statistical methods.

Types of ICT tools and platforms used in post-pandemic period of teaching and learning:

- **Video conferencing platforms:** These platforms allow teachers and students to connect remotely for live lessons, and discussions. During the pandemic, teachers and students used some popular video conferencing platforms, including Zoom and Google Meet.
- **Online collaboration tools:** These tools allow students to work on projects and assignments remotely. Some popular online tools, including Google Docs and Google Classroom, are used to share assignments.
- **Social media:** A few of the most widely used social media platforms used by teachers and students include WhatsApp and Telegram to share course materials, announcements, and discussions, and to connect with students outside of class.
- **Email:** Email was a common way for teachers and students to communicate and share files.
- **Personal devices:** Many students utilized devices, including laptops, iPads, and smartphones, to access online learning resources and complete assignments.

Shifting to Digital Learning in Education:

The integration of digital technology into every part of education is known as the "digital transformation of education," which benefits students and significantly changes the way they function. Learning with ICT is improving. In campuses, libraries and learning centres, workplaces, and homes, ICT is becoming a faster and more friendly user. It enables students to adopt new rules and responsibilities as they move from dependent classroom learners to independent learners.

Problems & Challenges of Online Learning:

- According to students, the inadequate infrastructure of information and communication technology (ICT) made it challenging to adapt to online learning. Good digital infrastructure, including mobile devices, computers, a reliable network, and the Internet, is essential for online education and learning. However, according to the findings of this study, many students do not have cell phones, computers, or access to continuous energy. A large number of students come from rural areas, where there is a lack of excellent infrastructure, which presents a problem for students.

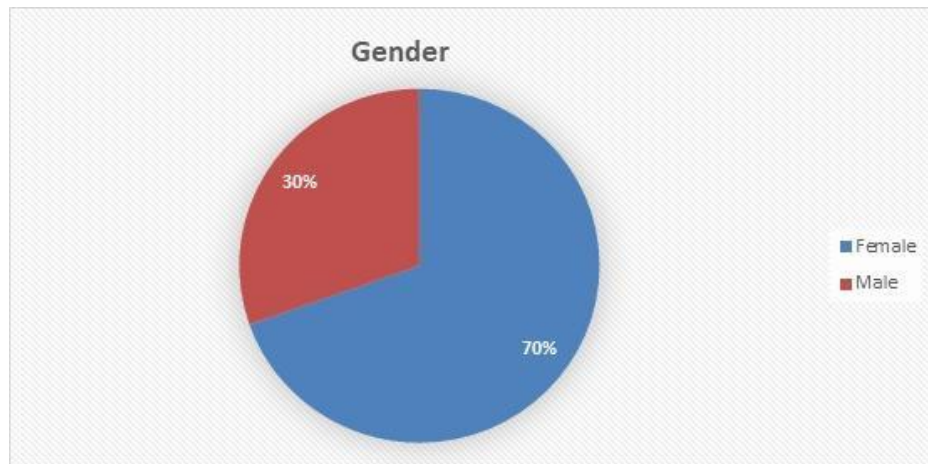
- The forced digital transformation of education was also stressful, as students had to adapt quickly to new online techniques, with little or no training in some cases and in certain situations.
- The sudden transition from face-to-face to distance(online) learning also required technical support from educational institutions or the government. Enabling Information and Communication Technology based education all of a sudden during the covid pandemic students have faced many physical and mental issues. Stress and anxiety, lack of interest, Lack of interaction, social isolation, and fatigue are the major mental issues faced by students. Eyesight problems, lack of classroom ethics, and lack of physical activities are the major physical issues.
- Some students don't have mobile phones (especially female students) or other sources for their learning, and it's become a major challenge for online learning. Digital tools must be needed for online learning, absence of these it is impossible to carry out study online.
- A maximum number of students in colleges are from rural communities, so in some rural areas network coverage is inadequate, which can contribute to educational inequity.
- Online learning has an effect on the quality of education. Students could be hesitant to use these new techniques, because they don't have experience with online education and their attitudes towards the using technology can change, as may their willingness to learn new online resources.
- Learning at home, students face difficulties, a home atmosphere might not be good for learning because of noise, household activities, and other distractions that make It is challenging for them to concentrate on their studies and activities.
- According to student's responses, learning through virtual classes or web-based learning is partially effective. A maximum number of students is preferable for offline classes.
- Lack of motivation is another problem. In classroom teaching students are motivated in many ways by the teachers and they will follow all the instructions of teachers so students are under the teacher's control but in online platforms students lose their motivation and there may not any control over the students. Due to the online classes, there is no face-to-face interaction between student and teacher.
- Digital literacy and Technical Issues are also big problems, during and after post covid pandemic. Many of the students don't have knowledge about digital tools and their usage.

Impact of Information and Communication Technology on Student's Education:

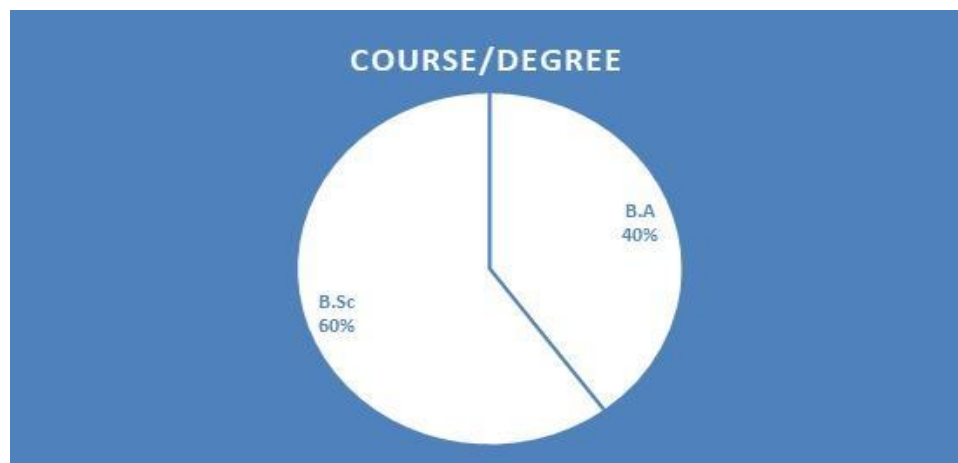
- Information and Communication Technology (ICT) is changing the way students learn. It helps improve their learning outcomes and gives them the chance to build skills like creativity, communication, and critical thinking. As we move forward, the future of education will rely more on smart tools such as e-learning platforms and digital classrooms.
- Information and communication technology (ICT) enables students to complete work more quickly and efficiently. Students used to have to go to libraries for information, but now they can get it all online.
- Technology is a significant part of students' daily lives. Various tools and software are available to help them learn and build their ICT skills.
- ICT is also used as a learning platform, allowing students to exchange ideas and better understand topics. Mobile devices have allowed many students to improve their grammar and English skills on their own.
- Using ICT in classrooms allows students to learn more efficiently, work together, and better understand their environment. ICT keeps students interested and actively involved in their education.
- Before the COVID-19 pandemic, Only a few students (0–25%) used digital learning tools. After the pandemic, this number rose to 50–75%. ICT has greatly improved how learning takes place.
- The pandemic sped up the shift toward digital education. Thanks to ICT, it became easier to reach students and continue teaching even during difficult times. Without it, education would have faced major challenges.

Research Findings:

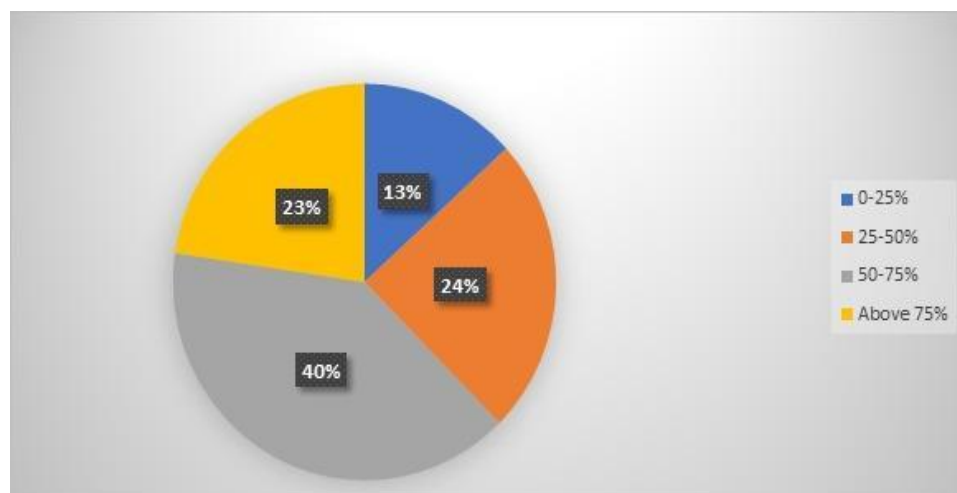
The following diagrams were drawn from the responses submitted by the respondents.

1.1 gender of the respondents

Gender distribution of respondents reveals that a majority (70%) are female, while the remaining 30% are male. It means that female participants formed a significant portion of this study sample, which could influence perspectives and responses related to ICT-based education during the pandemic.

1.2 course/degree of respondents

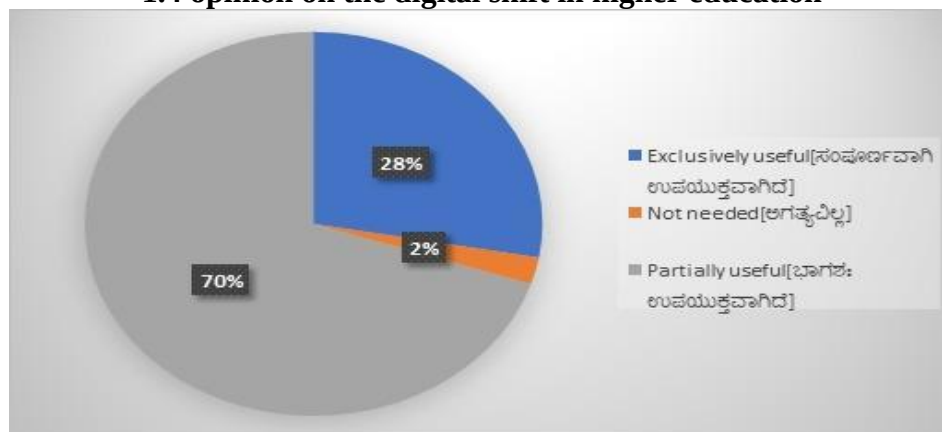
The distribution of respondents by course shows that 60% are pursuing a B.Sc. degree, while 40% are pursuing B.A degree. This indicates a greater representation of science students in the study, which could show their greater reliance on or exposure to ICT-based education during the pandemic.

1.3 mode of learning in post-covid pandemic

After the COVID-19 pandemic, a survey was done with B.A. and B.Sc. students were surveyed to determine how much they utilized digital learning. The findings reveal that 13% of students used digital learning only a little (0–25%), and 24% used it (25–50%). About 40% of students used digital learning a lot

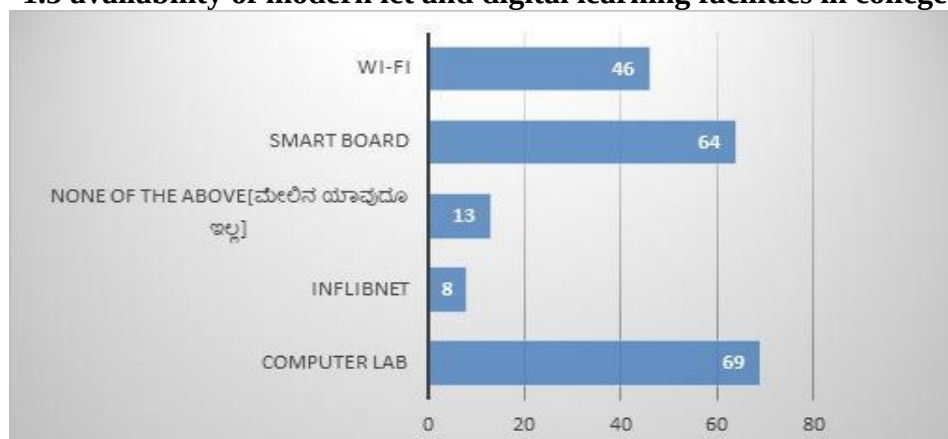
(50–75%), and 23% used it very often (more than 75%). This shows that after the pandemic, a larger number of students became used to digital learning. It became an essential component of their learning, helping them to continue their education even though they could not attend classes in person.

1.4 opinion on the digital shift in higher education



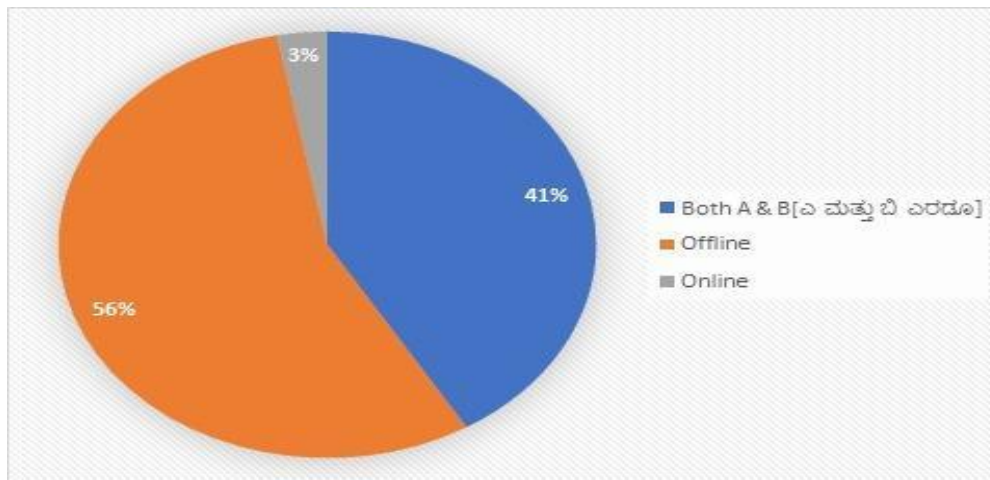
Students were asked to share their thoughts about the shift to digital learning in higher education. According to the results, 28% of students said that digital learning was exclusively useful, showing that they found online education very helpful. A very small number, only 2%, said that digital learning was not needed. The majority, 70%, felt that digital learning was partially useful, meaning they saw some benefits but also felt that it could not fully replace traditional classroom learning. Overall, most students recognized the importance of digital education, but many still prefer a combination of both online and in-person learning for better results.

1.5 availability of modern ict and digital learning facilities in college



The college provides various modern ICT and digital learning facilities such as computer labs, smart boards, Wi-Fi connectivity, and access to online academic resources like INFLIBNET. According to the survey 51.88% reported the availability of computer labs, 48.12% reported the use of smart boards, and 34.59% had access to Wi-Fi. However, only 6.01% of students reported using INFLIBNET services. Additionally, 9.77% of students indicated that none of these facilities were available to them. The data reflects a progressive move towards digitalization in education, though further improvements in internet access and digital resource usage are needed.

1.6 students' preferred mode of learning

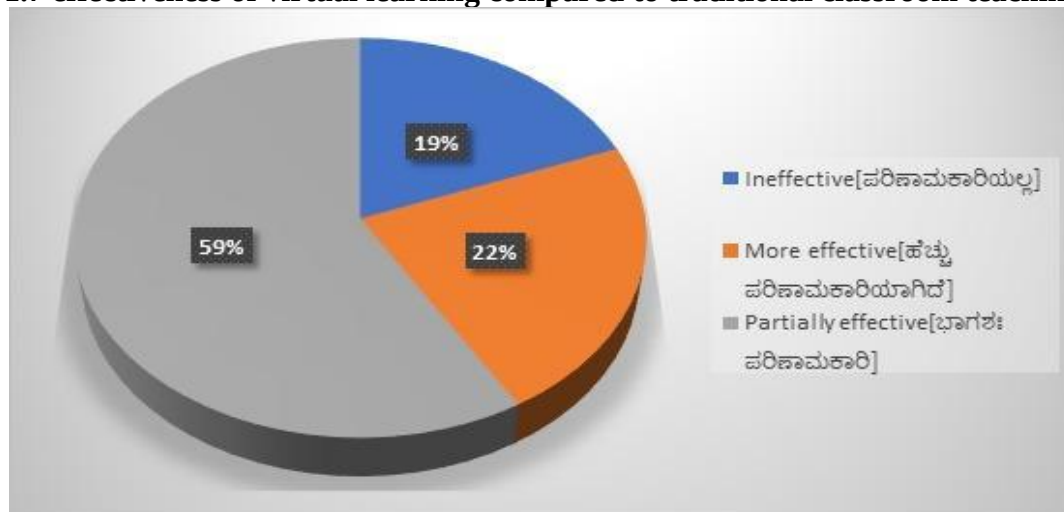


The survey regarding preferred modes of learning among students revealed that 56% preferred offline learning, indicating a strong inclination towards traditional classroom-based education. Around 41% of students preferred a mix of online and offline learning, showing support for blended learning methods. Only 3% of students preferred fully online learning. These findings reveal that even though digital learning is becoming increasingly accepted, there are still some concerns or challenges; offline and blended learning modes remain the most preferred among students in the post-pandemic period. There are multiple reasons why this could be true.

Face-to-face interaction: In offline learning, students can talk and connect with their teachers and classmates face-to-face, which allows for immediate feedback, clarification of doubts, and collaborative learning.

- Classrooms offer a more controlled environment that minimizes distractions and helps students focus on the learning material.
- Non-verbal communication: Offline learning makes it possible to share non-verbal signals like facial expressions, body language, and tone of voice, which can enhance understanding and build rapport between teachers and students.

1.7 effectiveness of virtual learning compared to traditional classroom teaching



The survey aimed to compare students' views on virtual or web-based learning with regular classroom teaching. The results show that 59% of students found virtual learning to be partially effective, indicating that while it supports learning to some extent, it does not fully replace traditional methods. About 22% of students considered web-based learning is better than traditional classes, regular classes, showing that a portion of students adapted well to online education. However, 19% of students reported that learning through online was ineffective when compared to face-to-face teaching. These findings reveal that even though virtual learning has become an important part of education after the pandemic, many students still value traditional classroom interactions for a complete learning experience.

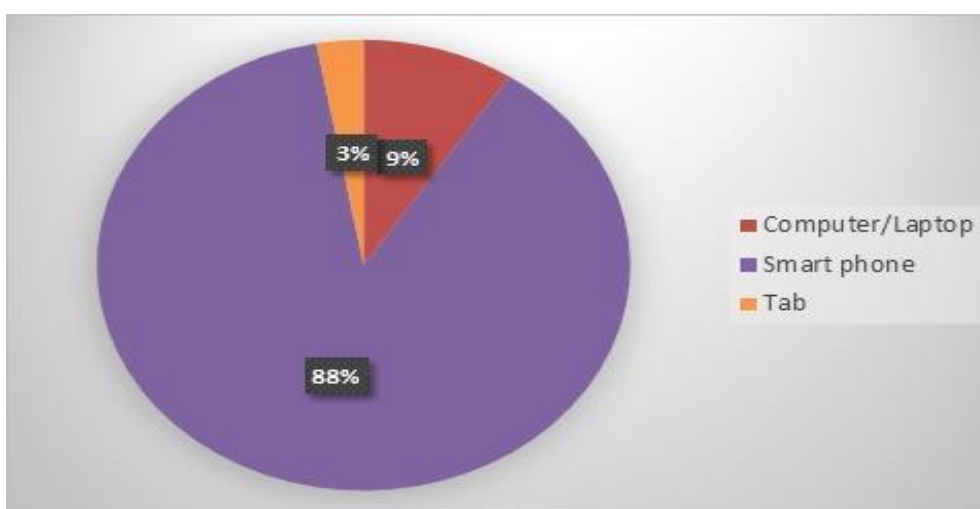
There are several reasons why students might prefer virtual classes or web-based learning to regular class teaching. Some of the reasons include:

- Convenience and flexibility: Virtual classes and web-based learning can be accessed from anywhere with an internet connection, which can be beneficial for students with busy schedules or living in remote areas.
- Engagement and interaction: Virtual classes can use a different kind of tools and technologies to enhance engagement and interactivity, such as video lectures, simulations, and online discussions.
- Reduced costs: Online classes can cost less than regular classes, as there are no costs associated with renting classroom space or hiring teachers.

However, there are few limitations to virtual classes or web-based learning. Which are

- Lack of interaction: Virtual classes can lack the face-to-face interaction that is often beneficial for learning. This can make it challenging for students to remain motivated and involved.
- Technical problems: Technical problems can disrupt virtual classes and make it difficult for students to learn.
- Distractions: Students may be more easily distracted at home than in a traditional classroom setting.

1.8 devices used by students for their study



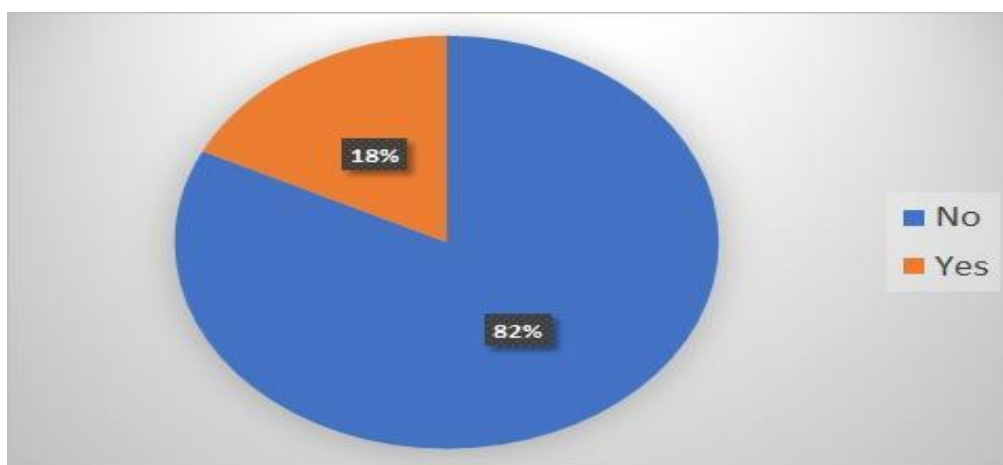
The survey results show that 88% of respondents used a smartphone, 9% of respondents used a computer or laptop, and 3% of respondents used a tab.

According to the survey most students relied on smartphones as their primary tool for studying. This is because of the convenience and portability of smart phones. Smartphones can be used to access learning materials, take notes, and participate in online discussions from anywhere.

The relatively small percentage of students who used a computer or laptop to study could be attributed to the devices are less portable than smartphones. Additionally, computers and laptops may be expensive than smartphones, making them less accessible to some students.

The smallest percentage of respondents used a tablet to study, because they are less portable than laptops and less versatile than smartphones.

1.9 government support for students' digital education needs



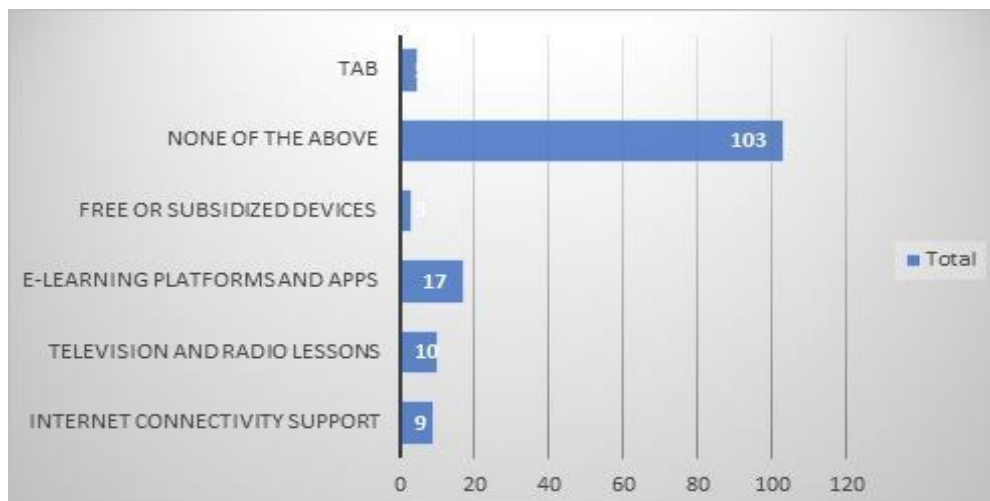
Students were questioned if they received any form of digital or technical support from the government for their education. According to the responses, 82% stated that they did not receive any assistance, while only 18% reported receiving support. This shows that most students did not have access to government-provided resources like internet services, devices, or learning platforms.

This points to a gap in how well such support programs are reaching students, highlighting the immediate need for more inclusive and accessible digital aid, especially given the growing reliance on online learning after the COVID-19 pandemic.

Some Factors may explain this gap, such as:

- **Lack of awareness:** Some students may be unaware of the support programs available to them.
- **Eligibility requirements:** Certain programs may impose criteria that not all students can meet.
- **Ineffective program design:** The government programs may not be designed effectively for students.
- **Lack of funding:** The government may lack the financial resources to assist every student who requires help.
- **Technical problems:** Technical problems with the government programs make it difficult for students to access them.

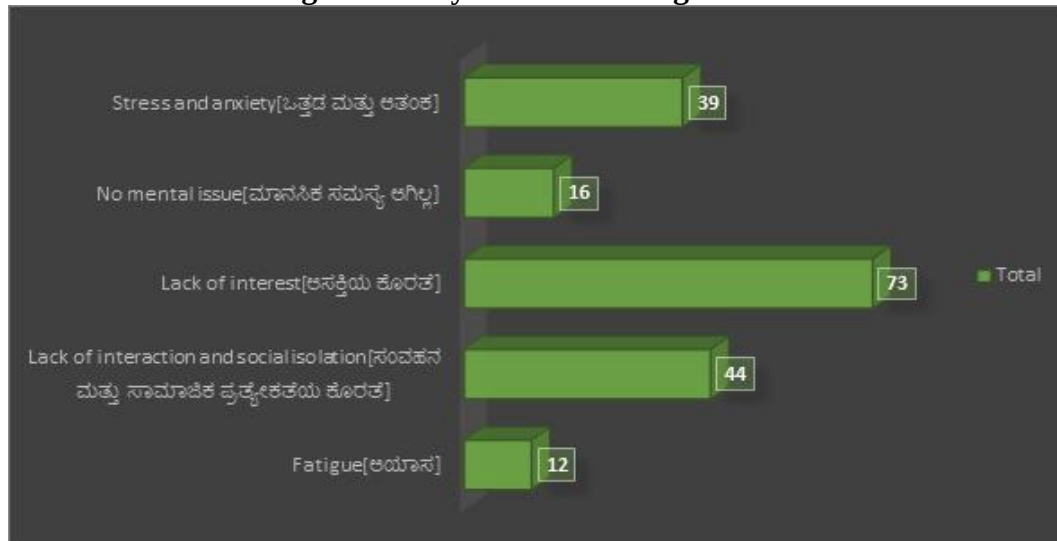
2.0 types of government support received for digital learning



The graph shows the various forms of government support received by students, along with the percentage for each type.

Out of the students who claimed to have received some form of government support for digital learning, a deeper look shows that the majority 77.4% selected "None of the Above," indicating that in reality, they didn't profit from any specific or effective support. Only a small number benefited from actual government initiatives: 12.8% of students accessed e-learning platforms and apps, 7.5% used television and radio lessons, 6.8% received internet connectivity support, 2.3% got free or subsidized devices, and just 1 student was provided a tablet (TAB). This information implies that, although the government took some initiatives, they failed to reach most students effectively, highlighting a significant gap in the practical implementation of digital education support programs.

2.1 mental health challenges faced by students during sudden shift to online learning



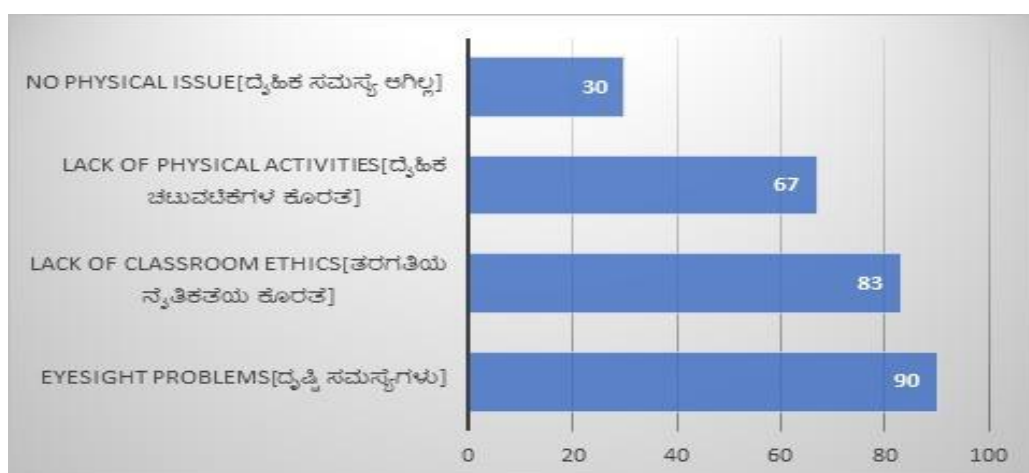
When students were questioned about difficulties with mental health caused by the sudden move to online learning during the COVID-19 pandemic, 55% reported feeling a loss of interest in their studies. 33% felt a lack of interaction and social isolation, while 29% reported stress and anxiety. 9% experienced fatigue, and only 12% said they had no mental issues. Most of students were mentally affected in some way during the transition to digital education.

According to this study, the sudden transition to ICT-based education during the COVID-19 pandemic had a significant negative impact on the mental health of students. The most frequently reported mental issues were lack of interest, stress and anxiety, and lack of interaction and communication.

There are several reasons for these findings. One possibility is that students found the sudden transition to ICT-based education to be overwhelming and stressful. ICT-based education can be more demanding than traditional face-to-face education, and students may feel pressure to perform well in this new environment. Additionally, students may have missed the social interaction and communication that comes with traditional face-to-face education.

Another possibility is that students simply found ICT-based education to be less engaging and interesting than traditional face-to-face education. ICT-based education can be isolating, and students often struggle to stay focused and motivated while learning online.

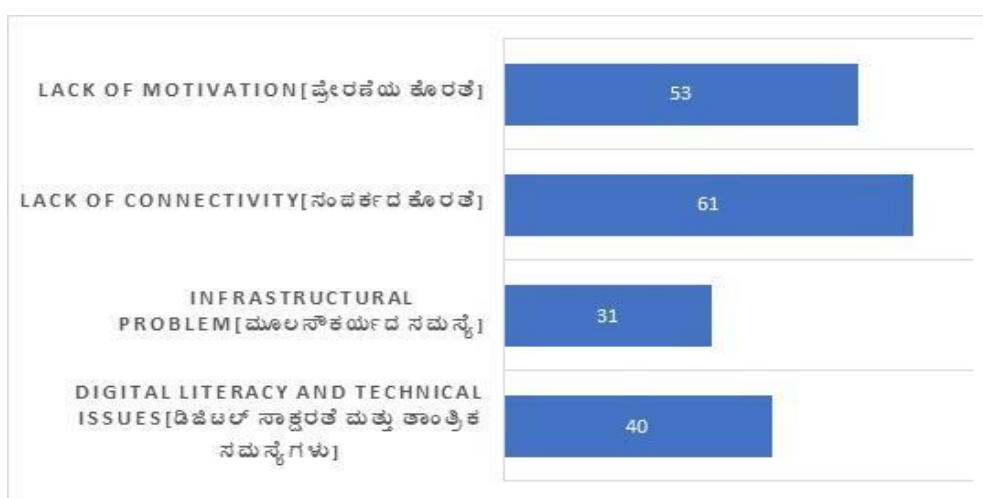
2.2 physical health issues faced by students during online learning (covid-19)



Due to the sudden shift to online learning during the COVID-19 pandemic, many students reported facing physical problems. 68% of students experienced eyesight problems, while 62% reported a lack of classroom ethics. 50% said they faced a lack of physical activity. Only 23% of students mentioned they had no physical issues. This shows that the transition to digital education had a noticeable impact on students' physical well-being. Here is a more detailed analysis of each of the physical issues listed on the chart:

- **Eyesight problems:** Spending long hours in front of screens during online learning has caused problems like eye strain, dry eyes, and blurred vision. It is important for students to take breaks from screens regularly and to follow the 20-20-20 rule: every 20 minutes, look at something 20 feet away for 20 seconds.
- **Lack of classroom ethics:** Learning online has made it harder for students to follow classroom rules. They may interrupt more or try to multitask, which can disturb lessons and even result in physical discomfort like neck pain or headaches.
- **Lack of physical activities:** Online learning can also cause to a decrease in physical activity, because students are not need to walk to and from class or to participate in physical education classes. A lack of physical activity can lead to a variety of health problems, such as weight gain, obesity, and chronic diseases.
- **No physical issues:** While nearly 19% of students said they had no physical problems from online learning, this might be because they weren't aware of the effects or didn't recognize online learning as the cause.

2.3 major challenges faced by students in online teaching and learning



Among the students surveyed, 46% reported a lack of connectivity, followed by 40% citing a lack of motivation. 30% faced digital literacy and technical issues, and 23% experienced infrastructural problems. This indicates that poor internet access, low motivation, and technical difficulties were the major barriers to effective online teaching and learning.

This analysis suggests that the biggest problems with online teaching and learning in are:

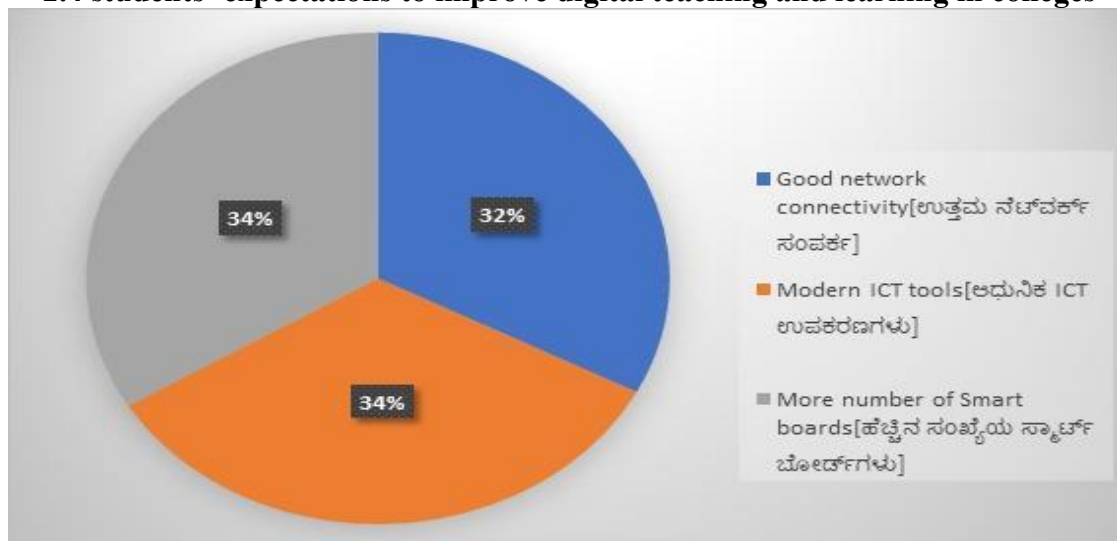
- **Lack of motivation:** Many students struggle to stay engaged in virtual learning environments, especially when there is limited interaction with teachers and peers.
- **Lack of connectivity:** Many students may have unreliable internet access, This can make participation difficult in online classes and complete assignments.
- **Digital literacy and technical issues:** Certain students lack the technology or technical expertise required for successful online education.
- **Infrastructural problems:** Schools and educational institutions don't have the necessary infrastructure to support online teaching and learning, such as reliable internet access, computers, and other devices.

Here are some possible solutions to the problems identified in the survey:

- **Lack of motivation:** Teachers can use various strategies to keep students motivated in an online learning environment, such as providing regular feedback, engaging in interactive activities, and creating a sense of community among students.
- **Lack of connectivity:** Institutions can team up with internet providers to expand internet access in their areas and offer digital tools like laptops or tablets through community centers.

- **Digital literacy and technical issues:** Colleges and schools should offer training sessions to help both teachers and students become more familiar with digital learning platforms.
- **Infrastructural problems:** Governments and other stakeholders can invest in improving the digital infrastructure, such as expanding access to high-speed internet and providing educational institutions with the necessary equipment and resources.

2.4 students' expectations to improve digital teaching and learning in colleges



Students have nearly equal expectations to improve digital learning in colleges. Around 34% of respondents expect the use of modern ICT tools, another 34% expect more smart boards in classrooms, and 32% believe that good network connectivity is essential. This indicates a strong demand for better digital infrastructure and smart teaching methods to enhance the quality of education.

Implications for colleges:

First, they suggest that colleges need to invest in improving their network connectivity and providing students with access to modern ICT tools and smart boards. Second, they suggest that colleges need to focus on developing new technology-enabled learning programs and teaching methods. Third, they suggest that colleges need to find ways to take steps to lower the cost of higher education so that majority students can access and complete their studies without a financial burden.

Overcoming the Challenges:

At the time of unavailability of mobile phones or other digital support, students got support from their friends and relatives and continued their learning. Students got some digital/technical support from the government for their education after the pandemic. Today they are accessing Jnana Nidhi, E-Patha Shala, Digital Library and Government-provided TAB, and Laptops for their education. After the pandemic teacher's support was good for student's online-based education. At colleges, Wi-Fi and Computer lab facility is given to students, which helps them to study. By providing infrastructural facilities student's interest in technology-based learning has doubled.

Suggestions:

- Governments and educational institutions should invest in improving digital infrastructure, especially in rural areas, by providing access to computers, the Internet, and electricity.
- Mobile phones are more prevalent, educational content should be optimized for mobile access to reach students without computers.
- To help teachers and students use online learning resources efficiently, educational institutions should provide training courses.
- Encourage students to assist one another with technical issues, creating a peer support network.
- Encourage teachers to enhance online classes with interactive elements by including discussions and group activities.

- Educational institutions could collaborate with telecom providers to improve network coverage in remote areas.
- Offer downloadable offline resources for students in areas with poor connectivity.

Conclusion:

Higher education has changed a lot after a few months of online learning. After the Covid-19 pandemic, online education has maintained its significance. Students in the learning processes encountered a number of challenges in adjusting to this new environment because the transition to online learning was quick and forced by circumstances. Educational institutions should be aware of these challenges and mobilize support to get over them as soon as possible. They should focus especially on digitizing the learning processes and provide students with specialized technical training. In order to meet students' expectations and improve their learning experience in the modern digital environment, educational institutions should develop a comprehensive combination of face-to-face and online learning, and Governments and educational institutions need to increase institutional capacity to respond quickly to modern ICT and digital learning platforms.