



Education in the Digital Age: Highlighting the Gap between Physical and Virtual Classroom Environments

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Abstract

With the advancement in technology each passing day, the world has now moved towards a new dimension of reality i.e., The Virtual Reality. From Letters to Email, theatres to OTT platforms, In-cash to Cashless Transactions, window shopping to E-marketplace, workplace culture to remote working concept (Work from Home), classroom education to online learning and many more. The major point of concern is the shift in educational methods since it is among the major factors affecting the development of an individual. The Covid 19 pandemic has brought in a complete revolution in the field of education. The compulsion to maintain continuity in education has opened up a whole new concept of virtual classrooms via Google Meet, Zoom, Webex, and others. The students were forced to sit in front of a screen with muted mics gazing absent-mindedly. Some of the students as well as teachers were and still are lacking the proficiency with virtual tools and platforms. This proved not to be a student-friendly method as the lack of face-to-face interactions led to a sense of isolation and misunderstanding between both. Traditional Classroom methods allowed both the student and teachers to have a two-way conversation enabling them to explore different aspects of gaining knowledge. The traditional classroom learning also enables the student to develop a sense of unity with their fellow classmates leading them to exercise teamwork, leadership qualities, time management, discipline which is deficient in the virtual methods. The study aims to highlight the gap between the virtual and physical classroom environments and the fact that physical classrooms are way more effective and productive as compared to Virtual Classrooms.

Keywords: *Technology, Virtual Learning, Traditional Classroom, Online v/s Offline, Student, Knowledge*

Introduction

Digital age has undergone a transformation in the educational landscape. There are advancements in technology to enhance learning experiences. Technology has enabled access to information and connectivity. The integration of digital tools and online platforms certainly upheaved traditional classroom-type methodologies of education, therefore offering the best opportunity for personalized learning, global collaboration, and instant access to a wealth of information; at the same time, though, it presents opportunities and challenges for the learner and the educator.

Looking a few decades back, Classrooms meant a small room with desks, blackboard and colourful charts on the wall. This concept of classroom was optimally derived from the ancient setting of Gurukuls where the Guru (Teacher) and his shishyas (students)

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used to sit in an open space close to the nature to gather knowledge on various subjects like *Rajneeti*, *Yudhneeti*, *Shastra-Gyaan*, *Ayurvedigyaan*, *Dharm-shastra*, *Arthshastra*, etc. With the colonization of India by British, this concept was further compressed into a closed room which later took the form of digital screen-based classroom due to Covid Pandemic.

On one hand, Physical classroom environment is characterized by face-to-face interactions, hands-on experiences, and immediate feedback. The social aspects of learning, including peer collaboration, mentorship, and the development of skills, are integral to the educational process. These are often diminished in a purely digital context. Moreover, physical environments provide essential support structures, such as access to libraries, laboratories, and extracurricular activities. Whereas on the other hand, the virtual learning environment has underscored the potential of digital education to reach diverse populations. Education has become more flexible and inclusive with online courses, virtual classrooms, and digital resources. It allows the students to learn at their own pace and from any location. Despite the enhancement of digital tools, personalization and accessibility, it failed to effectively integrate technology into their pedagogical practices. There is a stark contrast between the interactive nature of online environment and physical setting.

This research paper aims at the disconnection between virtual and physical learning environments. It deals with the implications for teaching, learning and students' outcomes. Online education offers convenience but it lacks the interactive experiences and social interactions provided by physical classrooms. The study employed a mixed-methods approach to investigate the effectiveness of virtual classrooms compared to physical classrooms which consisted of three phases. A questionnaire was designed to gather data from students on their experiences, preferences, and perceptions of virtual and physical classrooms. The survey was administered online to a sample of 100 students. It included both closed-ended and open-ended questions to collect quantitative and qualitative data. Semi-structured interviews were conducted with students and teachers to gather more in-depth information on their experiences and opinions. These were conducted in person, allowing for follow-up questions and clarification. A comprehensive review of existing literature on virtual and physical classrooms was conducted to provide context and background information.

Quantitative data from the survey was analysed using descriptive statistics and inferential statistics to identify significant differences between virtual and physical classrooms. Qualitative data from the survey, interviews, and literature review was analysed using thematic analysis to identify patterns and themes.

Discussion

"Education is the most powerful weapon which you can use to change the world."

- Nelson Mandela

Nelson Mandela highlights the transformational power of education in promoting global progress, transforming cultures and empowering people. He redefines the core of education both in terms of delivery and education. It shapes the cognitive, social, and emotional development of a person, which contributes substantially to personality



development. Education offers an individual knowledge and skills that improve intellectual capabilities, critical thinking, and problem-solving aspects. It exposes one to different cultures and perceptions, hence developing empathy, broad-mindedness, and good communication. It is through education that enhancements in the attributes of teamwork, communication skills, time-management, leadership skills, goal-setting abilities, and interpersonal skills can be achieved for all-round development of an individual's personality.

Since the occurrence of virtual classrooms and digital learning tools, education has the potential to democratize, it makes it more accessible and inclusive. But this shift also focuses on a crucial difference that exists between virtual learning and conventional classroom settings. The difference between both has important implications regarding effectiveness and fairness of education.

Physical Classroom

“The classroom is a place where students are not just recipients of knowledge but co-creators in the learning process.”

- Paul Freire

In a traditional classroom, education can be powerfully experienced through direct human engagement, practical experiences and the social dynamics which arise in a physical area. This physical presence environment fosters a collaborative learning, immediate feedback, and a sense of belonging, which are crucial for the growth of emotional intelligence and soft skills. The presence of educators and peers, interacting in a shared physical space provides a valuable guidance, encouragement, and a supportive learning atmosphere that facilitates direct communication, immediate feedback, and collaborative activities.

One of the most important aspects of Classroom teaching is Lecture-based Learning which involves a teacher delivering a lecture while students absorb the knowledge, takes notes and ask questions. Lectures are particularly effective for introducing new topics, providing comprehensive overviews, and explaining complex concepts. Lectures aim at delivering larger information to broader audience at once with face-to-face interaction providing clarity, critical thinking abilities and relationship building in students. Teachers share their expertise, knowledge and its real-world applications which enriches the learning experiences. These lectures often involve the Socratic method which is a technique of questioning students at certain intervals during the lecture to encourage them to think critically upon the matter. This is beneficial for students as it enhances their interaction scopes, communication skills, self- confidence and academics performance promoting analytical thinking, problem solving and exploration of the idea from multiple perspective. This technique helps the students to have a deeper understanding of the subject matter through discussion and exploration stimulating active student participation and engagement in the learning process.



Collaborative learning is also a very essential aspect of classroom learning where students either themselves or encouraged by their teacher form smaller groups to achieve common goals of learning. Through this approach students learn from each other exploring multiple perspective on a particular subject matter emphasizing on collaboration, teamwork, conflict resolution and reinforcing their understanding. Even the project-based learning encourages the students to especially focus on the subject matter enhancing their perspective and knowledge in that particular area.

Physical classrooms, apart from these benefits also has a few disadvantages. The large classroom with hundreds of students and one teacher often turns into a one way engagement as the teacher sometimes delivers the lecture fluently without bothering about the student's pace of learning and understanding. The good scorers could always be benefitted with these but the average and below average students always struggles in keeping up with teacher's pace and misses a lot of syllabus as well as the opportunity to gain knowledge.

Digital Classroom

“Access to quality online learning is an important step in helping people future-proof their skills and seek new opportunities for growth and development.”

- World Economic Forum

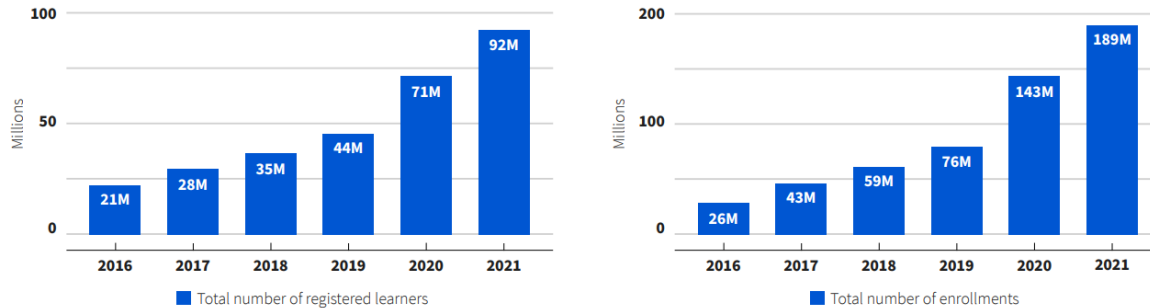
Digital Education came into effect since the advent of computer, internet and technologies since 20th and 21st century. High speed of internet has accelerated digital learning tools. It provides content according to individual needs and learning styles. A virtual classroom is a classroom facilitated by digital platforms like Google meet, zoom etc. where educators and learner can interact with each other from their homes. It allows to connect and learn to the approach of digital learning to education is enhancing and expanding the learning experience.

Digital classroom aims to break down geographical barriers and equip learners with the skills to utilize technology. During covid-19 when schools and universities were forced to close their doors, online education remained the only option to continue learning. Institutions rapidly adapted themselves with digital platforms and are still continuing with them. Digital divide was highlighted during the pandemic impacting learning outcomes with disparities in access to technology and internet connectivity. Internet connectivity provides lifelong access to educational resources for both personal and professional development. Learners can access resources from anywhere and anytime according to their comfort.



More learners are accessing online learning

The demand for online learning on Coursera continues to outpace pre-pandemic levels.



Impact Report, Cousera, 2021

The above graph shows the growth of learners accessing online learning. This is beneficial for students living in remote areas. It is affordable especially free online courses, free textbooks or study materials. In a technology-based learning difficulty is based on the learner's adaptability and his pace of learning. Online learning requires self-discipline, time management and self-controlled environment and more importantly digital literacy for both the educator and the learner. It provides global reach i.e., students can connect to any part of the world and learn from different-different educators according to their satisfaction level. Educators can also share resources and materials easily, gather data on student's performance, globally connect with other educators through video conferencing and share their best practices.

Though virtual learning provides flexibility and accessibility, it fails to develop interpersonal skills, teamwork, and a sense of community in a student. These sort of learning classes were conducted through recorded lectures but the concept of a compact classroom through Google Meet and Zoom classrooms were brought into extensive use only after the Pandemic situation which forced the world to shut down the mobility for certain period of time. However, School and University level Education is not something which could be paused for a longer period of time. Hence, the compulsion of maintaining continuity introduced students to the Virtual classroom i.e., Google meet and Zoom Meetings.

Comparative Analysis

Classroom Pedagogy often include various aspects of teaching method which include props, physical activities, experiments, observation which can easily be conducted in classroom with physical presence of students but is rarely applicable on the virtual classroom through screen. The physical classroom offers face to face interaction which is lacking in virtual classroom. The emotional connectivity we gain from the presence of teacher within the boundaries of a physical classroom is way more efficient than that of gazing on a moving picture through the screen. We, as students can also receive instant feedbacks and clarifications on our doubts which makes our learning more dynamic and effective through face-to-face interaction. The body language, facial expressions, gestures of both the educator and the learner supports each other aiding for a better understanding and communication.



There are lesser chances of distractions in a close environment of a classroom as the educator always has a eye of the learners whereas in e-classrooms the teaching spirit of the educator remains the same but he cannot keep a record of his students actions and concentration. Apart from that, the continuously popping notifications on the screen of mobile or laptop is a major source of distraction for students. Students often need to wait for clarification of their doubts. Even if digital learning provides immediate feedback it may lack understanding that a teacher can provide in a classroom. They can adjust their teaching method according to students need. In learning from online classes or live classes, students may face technological disruptions which hinder their studies. Practical experiences like illustrations or activities which are calculated and practices in real time are missing in online learning. The chance of communicating with a peer is very less in virtual learning. Absence of peer interaction fails to develop empathy, respect and tolerance. Interaction with peers is very essential in the character development which is only provided in physical classroom. The lack of interaction with peers lead to a lonely feeling and has an impact on motivation and engagement of the learner.

Social activity in classroom provides opportunity to enhance personal development. Consistency in a classroom helps a learner to focus and develop discipline. Various types of assessment like oral presentations, practical exams and written tests help in the growth of a student. It encourages analytical thinking and creative solutions. In a classroom learning students does not reply much on technology though it enhances the way of learning and accessible to students. The in-hand experiences provided through exhibitions, workshops or seminars serves to be beneficial for professional development.

The flexibility provided in digital education may lead to procrastination. Students lack discipline without structured schedule. Classroom enforces a routine which helps students in developing time management skills. Too much dependency on technology leads to the decrease in attention span. Students lack fundamental skills such as handwriting and in-hand communication. Academic achievements help individual overcome challenges giving a sense of confidence and resilience.

Virtual Classes limits the depth of gathering information and makes it harder to keep students engaged while classroom learning enhances students understanding and engagement through discussions and body language. There is also encouragement in social interactions through extracurricular activities and group discussions. It provides a controlled environment which is particularly designed for learning, minimizing distractions. It promotes discipline and concentration. It allows direct attention from teachers. They can quickly address individual needs and adjust their teaching method accordingly. There is a negative impact to a students' mental health which is usually caused by prolonged screen time in digital learning. It also leads to eye strain, and changes in behaviour such as irritation, intolerance, feeling isolated etc.

While physical education contributes to overall health as it provides students' participation in sports or other activities. Classroom education provides real life

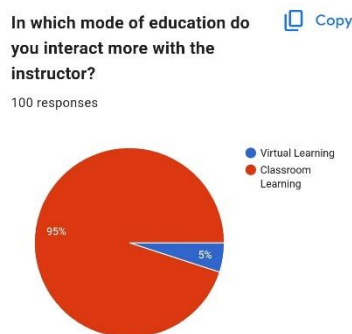


experience as it often includes field trips, lab experiments that provide practical knowledge and enhance learning. It also helps in student cognitive and emotional development by establishing a consistent routine. The presence of teachers helps a student in concentration and creates a sense of accountability. Traditional classroom has set timetable i.e., classes begin and ends in a defined time.

Survey Based Outcomes

A questionnaire-based survey was conducted among 100 students, primarily aged 18 to 25 years, pursuing their bachelor and courses, to collect data on their educational experiences and preferences. Most of them has already experienced attending classes via physical classroom, Virtual Classrooms, Live classes (Byjus/ Unacademy/ YouTube). A small group of people has also experienced distance learning as well as self-study (due to Correspondence courses).

Analysing the above discussion, it is observed that lack of face-to-face interaction with the instructor has always been a major disadvantage for both learners and educators as the absence of connection effects the learning process.



As per the survey, 95% of students agrees with the fact they are unable to interact with their instructor in the virtual classroom through their mobile screens. One of the major reasons being the absence of exchange of non-verbal cues like eye-contact, facial expression, gestures and body language between students and teacher due to muted mics and cameras turned off. A few of the students are also hesitant of turning on their mics to speak up as they could not trace any sense of encouragement through the eye contact with his fellow classmates or even the teacher.

The interview session with teachers also concluded that even they are unaware of the fact that their lessons were effectively delivered and understood by the students or not because they do not receive any response or feedback from students. Their teaching spirit is also sometimes hampered due to the same reason. Even the teachers doubt the conscious presence of a few students behind the screen. The technical glitches often disturb the fluency of the lecture resulting in failing to understand the subject area clearly leading to frustrations, isolation and a sense of lacking behind. Unequal access to technology also exacerbates disparities. Students with limited resources struggle more during technical disruptions.

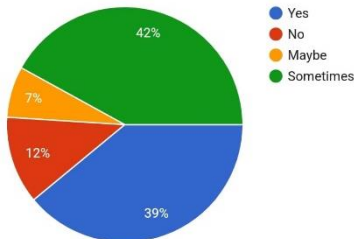
The teachers also highlighted the heavy amount of distraction students face while attending the



Do you often feel distracted and disconnected in Virtual classrooms?



100 responses



online classes. Major part of these distractions is initiated by the popping notifications of social media apps, gaming apps and other app sources available on their devices. Once the students click on these notifications, they are subconsciously dragged away from the class into the world of imagination and diversion. When the students were asked about the same, they also confirmed it as one of the major issues. A few of the distractions are also initiated due to the disturbing, noisy and unfit (for attending class) surrounding of the student. 39% of students clearly accepts the disconnection in online

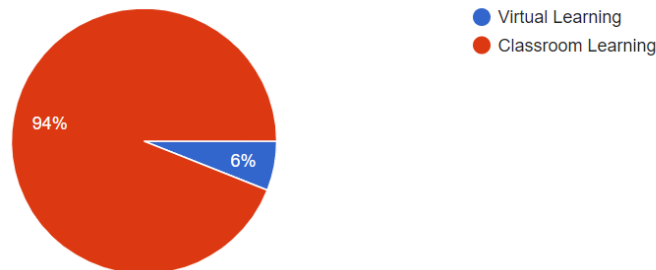
classes due to certain circumstances while 42% of students acknowledges that they are sometimes distracted while sometime managing to remain on track. However, only 12% of students are able to claim that they are fully concentrated while attending the classes. These students in order to multitask (e.g texting, checking social media, playing games) while attending classes misses out on important lessons.

The results of the survey also states that the students feels that qualities like teamwork,

Which of the following method could encourage building Teamwork, Leadership qualities, Personality development in an individual?



100 responses



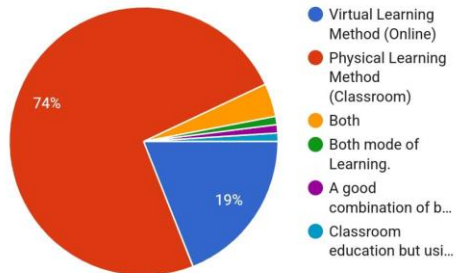
leadership, personality development, confidence building and communications could be induced in an individual majorly through traditional classroom method in the presence of teacher and their fellow classmates via in-person interactions. Various methods of Pedagogy and psychological understanding can be employed to inculcate the confidence and other qualities in them. Group Discussion has always played a major role in this concept. Exhibitions, Projects and workshops are also essential in developing teamwork conscience in students through interpersonal interactions. The teamwork also somewhere enhances the leadership quality and responsibility sharing capability as the students themselves volunteer to divide and lead a certain part of the project. They also learn to manage disagreement, critical problems and sudden and unexpected damages while negotiating and compromising their conflicts to achieve common goals.



Which of the following should be preferred as an effective mode of education in future?



100 responses



When asked to choose a better mode of Classroom education among physical and virtual for future, most of the students chose to continue with the traditional method of classroom teaching with the closed boundaries of a room and physical presence of the teacher. To be accurate, 74% of students choose the Physical Classroom method preferring the personality development, in-person interactions and other qualities induced by it, 19% students choose the Virtual classroom method keeping in mind the remote locations and time saving experience while 7% of students

also choose a combination of both to enhance learning opportunities.

A few of the students also justified their choice with reason:

1. The best choice depends on individual needs:
 - Virtual Learning: Flexible, accessible, cost-effective, but requires self-motivation and may lack social interaction.
 - Traditional Learning: Structured, offers face-to-face interaction, and hands-on experiences but can be inflexible and more expensive.

A blended approach can provide the benefits of both.

- Shalini Singh, Student of Post Graduation

2. Classroom learning is more preferable just because you can connect with the students. You can know their difficulties. You can interact with them easily. But in online classes you will phase difficulties to understand the problem. You will phase difficulties to interact with students who are active, who are not active, who are weak, who are good enough it will only be possible in the classroom learning.

- Abhishek Kumar Singh, Student of Graduation

3. I agree that through physical learning we learn many things from each other but we should also consider those who live far from their college. Because they don't feel cut-off from their classmates because of less interaction. Something, too long online classes were boring but I think virtual class was new for us and for our professors. And we are trying to adapt and accept this virtual presence.

- Zubia Naaz, Student of Post Graduation

4. Virtual mode is flexible, accessible and cost effective for remote participation.



- Mayno Hansda, Student of Post Graduation

Current Condition of Education in India

Education in the contemporary society has degraded into a coveted trophy- a status symbol - which everyone wants to achieve rather than a genuine pursuit of knowledge. Students find themselves embroiled in a cut throat competition in every field of education whether it be Medical, Engineering, Public Services, IT sectors, Commerce or Business studies. Several controversies always take the country by storms regarding the question paper leak issues, cheating in exams halls, paper checking inaccuracies and many more. These situations paint a grim picture of education not as a source of gaining knowledge but as a mere profit driven enterprise. The recent allegations of paper leaks in prestigious exams like NEET and UGC NET have raised concerns about the integrity of the examination process. Cheating and malpractices have become rampant, with instances of mass cheating and proxy candidates. The high-stakes competition for limited seats has created an environment where students feel pressured to resort to unfair means. Moreover, the coaching industry's influence has commercialized education, prioritizing profits over learning outcomes.

These practices need to be discouraged and the condition should be enhanced for the newer generations to be flourished with knowledge.

Conclusion

Significant advancement and challenges have been brought up by the evolution of digital education, particularly when comparing with physical education. Each learning pattern has its own pros and cons. Valuable opportunities and a sense of community is provided to the students in classroom which is difficult to replicate in online. The hands on experience available in traditional setting is irreplaceable in subjects which demand practice and experiment such as science, physical education etc.

Digital education has its advantages, specifically in terms of accessibility and availability of wider range of resources. It should be viewed more of a complementary tool rather than a replacement for classroom learning. The flexibility provided by the digital education has some technological barriers such as unequal access of internet connection or devices. It is very beneficial for learners who are working, or have to drop education for certain reason, for those who have barriers attending schools or colleges. Through digital education they balance their life. Resources available digitally are like treasures of knowledge. Educators help learners in what they need the most. Learners from diverse backgrounds learn from top tier educator at little to no cost.

The lack of interaction affects student motivation and engagement. It also gets difficult for educators to support a supportive learning environment. Technical difficulties hinder the learning process of a student. The absence of educator leads to cheating and use of unfair means during examinations and assessments.

Classrooms bring students from various cultures together and allow them to interact and create meaningful relationships. It promotes culture awareness enhancing



understanding and tolerance. The one - on- one mentorship in classroom guides students through personal and academic challenges. Experimental approach provided in the classroom helps student to apply theoretical concepts in real-world challenges. Students learn to use technology effectively developing digital literacy skill. It reduces the digital fatigue and promotes mental health. Despite each having their strengths, classroom education is preferred to be more suitable for both educators and learners in the process of teaching and learning.

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