# Virtual Learning and Gender Gap: An Exploration of Technological Adaptation in Indian Educators

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## ABSTRACT

Virtual classes have become a norm with the advent of the COVID-19 induced pandemic and subsequent global lockdown. Vast segments of populations have had to adjust to the new normal, which involved adapting to technologically aided human interaction. Fields like teaching where one-to-one interaction has been coveted by academicians worldwide also switched to virtual tools and platforms.

Different researchers delving into the field of education have explored the idea of varying Technological Adaptation vis-a-vis gender. Few fields, such as STEM, have traditionally been seen as male bastions, while softer pursuits like teaching were left for the women. But online education has brought both male and female academicians and instructors on the same ground.

This research explores the gender gap in adapting to new technologies and tries to evaluate if the attitude towards virtual interaction focused on teaching and learning is dependent on the sex of the individual. Surveying instructors from higher education institutes all over India, the paper utilizes quantitative data to ascertain the attitudes of both genders towards online teaching and learning. Lastly, the researchers try to estimate the sociological reasons behind the growth and decline patterns in the interest of various segments of the population.

## INTRODUCTION

Virtual classes have become a norm with the advent of the Covid 19-induced pandemic and subsequent global lockdown. According to a report by United Nations, the pandemic has caused the largest disruption in the history of education worldwide and has affected more than 1.5 Billion students in 190 countries (UN, 2020). Vast segments of populations have had to adjust to the new normal, which involved adapting to technologically aided human interaction in form of Video lectures, Virtual classes, and other tools and platforms for e-learning.

While remote learning was always an option, it wasn't favoured well because of the perceived importance of one-to-one interaction, hands-on training in skill-based education, and peer involvement that classroom education offers. Educators too favored this mode as it allowed them to be spontaneous in their lectures and get instant student feedback. The feedback allowed for further modification to teaching styles, like including more examples or planning an activity. But the pandemic removed the choice entirely and imposed online education as a necessity for all levels of education, from primary to higher degrees (de Oliveira Dias et al., 2020).

Technology had made its pathway in the education industry in form of ICTs (Information and Communication Technology tools) over the past decade. These ICTs were helping in delivering the curriculum and keeping a track of the student's progress. Several studies propounded that ICTs affected the student's attention and involvement in the classes thus affecting their performance

positively. But digital divide across the country affected the process adversely. Access to technology, internet penetration, and lack of resources ensured that the pace of adaptation wasn't uniform across the country. Universities dealing with distance education and open learning, like IGNOU, had been also utilizing various methods to reach out to the students, involving many platforms of mass media as well as Television and Radio. Virtual classes brought the focus on Internet-facilitated classes to maintain the momentum of education even with a lack of resources. The academic calendars needed to be matched up even at the time of lockdown (Pregowska *et al.*, 2021).

Various tech giants cashed on the opportunity and extended the services. Platforms such as Google meet, Zoom, Cisco WebEx, and Microsoft Teams offered various packages to educational institutes, ranging from free for limited services to institutional packs for places with resources and funds. Virtual teaching brought many challenges for the educators as well, not only did they have to master these digital platforms as soon as possible and run their classes online, they also had to plan their course content into a lecture, create material that could be disseminated online and ensure that students were learning through this method as well. They could not plan any group activities or activities involving physical participation, two things students immensely enjoyed in the classrooms (Wilcha, 2020).

Another challenge is the limited student interaction. With restrained bandwidth, attending classes from a distracting environment, and an option to switch off the microphones and cameras, students were less inclined to participate in the classes. Teachers all over the globe, across disciplines, reported a great decline in the response from students. Collaborative exercises came to a halt as the online environment made it easier for students to perform individual tasks and not in teamwork (Angelova, 2020).

Discussing India's education industry, women comprise about 55% of India's teaching force, teaching is supposed to be a softer pursuit that allowed teachers to maintain a work-life balance. But despite being a majority, the distribution across levels isn't uniform. Primary education sees more than 1 Lakh female teachers compared to only 27000 men. On the other hand, at secondary and higher secondary levels, about 8 lakh women were teaching compared to 10 lakh men. The

gap widens with an increase in levels. ("India | Education | World Bank Development Indicators", 2022). Higher education, especially in the fields of STEM has been seen as a male-dominated area, with few female educators making their way into the field. According to a recent Indian today report, men were more likely to teach at university levels due to the societal mindset that these institutions are more prestigious and offer higher pay packages. On the domestic front, studies claim that the lockdown added extra work pressure on women, as the domestic help was unable to travel, as men's participation in domestic chores in the country is negligible in general (Nazir, 2022).

Virtual classes have brought men and women across the entire education sector on the same front workwise. Education being an old and established discipline, several types of research have been conducted on how male and female educators adapt to technology. Gothwal et al discuss the impact of the lockdown on learners and educators while commenting that the attitude towards virtual classes improved tremendously over two years (Gothwal *et al.*, 2022).

This study explores the gender gap in adapting to new technologies and tries to evaluate if the attitude toward virtual interaction focused on teaching and learning is dependent on the sex of the individual. Surveying instructors from higher education institutes all over India, the paper utilizes quantitative data to ascertain the attitudes of both genders toward online teaching and learning. Lastly, the researchers try to estimate the sociological reasons behind the growth and decline patterns in the interest of various segments of the population.

**REVIEW OF LITERATURE**

While the research on the effectiveness of online tools, adaptation struggles in teachers, and effect on students is long-standing, a paper published post or during pandemic were picked up for this study, due to their microscopic approach.

Due to unprecedented times, there has been a lack of consensus on the adaptation of technology specifically in education. The variety of tools available makes it even more difficult to implement an industry-wide standard (Ilin, 2020.) The leadership in the industry has been held responsible

for influencing education technology adoption and implementation in the higher education sector. Other components which affect the adaptation are financial management and handling social networks online as these two factors have contributed heavily to making the workers comfortable working from the home situations (Lalani, Crawford & Butler-Henderson, 2021).

The effectiveness of using multimedia in teaching and learning has been verified and approved, and the adoption by educators and learners has been less researched. Park et al propose a model specifically for studying the adaptation levels with different moderators, such as individual characteristics. They suggest that it is the intersectionality of these factors that affect multimedia adoption for learning (Park et al, 2019).

On the other hand, studying attention spans and distraction in individuals within personal learning environments, Wu & Cheng explored Perceived Attention Problems(PAP) and Self-Regulatory Strategies (SRS) as reported by the individuals. It was found that males reported a greater number of Perceived attention problems and females reported having more versatile strategies to regulate their attention. Males reported having lesser attention spans and disorientation while using social media during teaching and learning (Wu & Cheng, 2019).

Technology and virtual working have been credited to shed attributes associated with identity online, or depersonalizing. Tome and Vaart have associated technology with depersonalization as it reduced emotional demands from workers (Tome & Vaart, 2020). Thus possibly removing the gender barrier that stands tall in offline learning.

The review helped in identifying a gap in studies exploring the technological adaptation in teaching and what role gender plays in it.

**Theoretical Framework**

A few theories that were found to be overlapping with the aims and objectives of the study were: Transformative Learning Theory: Mezirow proposed that learning is a process of "examining, questioning, validating, and revising or perspectives". The theory builds upon the existing adult

learning theories and propounds that a person's experiences formulate their perspectives and make help an individual in critically understanding and appreciating his/her thought process around various concepts, virtual learning in this case (Mezirow, 2018).

Another theory that finds a resonance in the aims of the paper is the Theory of Connectivist learning. Connectivism has been hailed as a theory of learning a new digital age, where all mankind, and thus all information is connected. In a time when access to information is not the problem, learning is recognizing the patterns in data, and the ability to critically replicate the action. The teachers and students are not just bound by a syllabus, but the boundaries of text are expanding with time (Siemens, 2004).

**METHODOLOGY**

Aim: The overarching aim of this paper is to estimate the levels of Technological adaptation in virtual teaching and learning in Indian educators.

Objectives: The specific objectives of the research are:
1. To estimate the comfort level of Indian educators with virtual learning tools.
2. To approximate their adaptation to Information and Communications Technologies (ICT) in post covid era.
3. To explore and identify a correlation between gender and comfort level with it.

Method: Acquiring a quantitative approach to obtain comparable results, an online survey was designed and adopted for the study. The survey was conducted over a week in an online mode and had a response ratio of 18%. Six months after the FDP, the respondents were also surveyed to find the specific areas where they were putting the skills learnt in the FDP to use and how beneficial they then thought the programme was. The response rate was 15% for this feedback survey.

Tool: A questionnaire based on the Likert scale was utilized for this purpose. Questions ranged from ascertaining the demographic profile of the respondent to recording attitudinal responses towards various implementations of ICT.

Sample: Indian educators from fields of STEM(Science, Technology, Engineering, and Mathematics), teaching at the collegiate level(+2) and above. In 2020, 61 female and 124 male instructors answered the survey and in 2021, 24 Females and 57 males instructors responded.

## DATA COLLECTION

A five day online faculty development programme was held with educators from across the country. The FDPs was organized by IGNOU, from June 8-12, 2020 and August 23-27, 2021. Though both the programmes were organised on different subjects, the commonality was that both were technical in nature and organised to facilitate The attendees were exposed to various methods and tools for online teaching and data was gathered on the first and the last day of the workshops. The survey in form of Google forms was floated after the end of the sessions each day and generated responses to elucidate their attitudes and perspectives towards online teaching and learning. Various factors such as enjoyment of the course (EC), perceived effectivity (PE), level of interaction (IN), and ability to retain attention (RA) were taken to be key areas of exploration.

## DATA ANALYSIS AND FINDINGS

The data was obtained in excel sheets resulting from the google forms. Further, the questions were related to the four variables, that is - attitudes towards the enjoyment of the course(EC), perceived effectivity(PE), level of interaction(IN), and ability to retain attention(RA), which were coded so. After coding these variables, data were segregated based on gender, vis a vis day 1 and day 3. After the segregation of data, the table was collated listing the degrees of responses to these variables. The tables are as follows:

| 2020 | | | | | |
|---|---|---|---|---|---|
| Levels | 1 | 2 | 3 | 4 | 5 |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Female (N = 61) | 1.64% | 3.28% | 6.56% | 31.15% | 57.38% |
| Male (N = 124) | 0% | 0.80% | 6.45% | 39.52% | 53.23% |
| 2021 | | | | | |
| Levels | 1 | 2 | 3 | 4 | 5 |
| Female (N = 24) | 0 | 0 | 8.33% | 25 | 66.67% |
| Male (N = 57) | 0 | 0 | 8.77% | 42.11% | 49.12% |

**Table 1: Levels of Interactivity**

Respondents were asked to report how interactive they felt the workshop was on a scale of 1 to 5, with 1 being the lowest and 5 being the highest. Table 1 depicts the levels of interactivity as reported by the participants. The majority of the participants reported a high level of interactivity witnessed in the online training program.

| 2020 | | | | | |
|---|---|---|---|---|---|
| Levels | 1 | 2 | 3 | 4 | 5 |
| Female (N = 61) | 1.64% | 0 | 11.48% | 34.43% | 52.46% |
| Male (N = 124) | 0 | 0.81% | 4.03% | 38.71% | 56.45% |
| 2021 | | | | | |
| Levels | 1 | 2 | 3 | 4 | 5 |
| Female (N = 24) | 0 | 4.17% | 0 | 37.5 | 58.33% |
| Male (N = 57) | 0 | 1.75% | 3.51% | 50.88% | 43.86% |

**Table 2: Level of Enjoyment**

The next set of questions probed the level of enjoyment in the participants. They were asked to report how well were they enjoying the workshop on a scale of 1 – 5, with 1 being the lowest again. Table 2 depicts the level of enjoyment as reported by them. Most of the participants reported enjoying the workshop.

| 2020 | | | | | |
|---|---|---|---|---|---|
| Levels | 1 | 2 | 3 | 4 | 5 |
| Female (N = 47) | 2.13% | 4.26% | 8.51% | 48.94% | 34.04% |
| Male (N = 104) | 2.88% | 4.81% | 8.65% | 56.73% | 26.92% |
| 2021 | | | | | |
| Levels | 1 | 2 | 3 | 4 | 5 |
| Female (N = 30) | 3.33% | 0% | 10% | 60% | 30% |
| Male (N = 85) | 4.71% | 2.35% | 3.53% | 63.53% | 28.24% |

**Table 3: Attention Retained**

The next set of questions explored the retention of attention of the respondents. Table 3 displays their feedback on a scale of 1 to 5, with 1 being the lowest attention and 5 being the highest. Most of the samples reported retaining their attention for a longer period.

| 2020 | | | | | |
|---|---|---|---|---|---|
| Levels | 1 | 2 | 3 | 4 | 5 |
| Female (N = 61) | 1.64% | 1.64% | 4.92% | 29.51% | 62.29% |
| Male (N = 124) | 0 | 0.81% | 4.84% | 33.87% | 60.48% |
| 2021 | | | | | |

| Levels | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Female (N = 24) | 0 | 0 | 8.33% | 20.83% | 70.83% |
| Male (N = 57) | 0 | 0 | 7.02% | 43.86% | 49.12% |

**Table 4: Perceived Effectivity**

Lastly, the sample was asked to rate the effectiveness of the workshop on a scale of 1 – 5, with 1 being the lowest again. Table 3 denotes their responses. Very few respondents opined that the workshop was not as effective as they had expected it to be.

After collating two years of data, and representing it in percentages to make a better comparison, their growth rate was tracked across the four parameters for both genders over a year. There was an observed rise in the levels of all parameters for women, as they reported a 9.3% hike in interactivity, about a 5.8% increase in their enjoyment levels, 7.02% responded with greater attention spans and 8.5% felt that a rise in the effectivity of the workshop. On the other hand, men reported a drop of 4.1% in interactivity, 12.6% in enjoyment, and 11.36% in overall effectivity of the workshop. The only category that saw a rise was attention retention which was around 8.11%.

| | Interactivity | Enjoyment | Attention | Effectivity |
|---|---|---|---|---|
| **Female** | 9.29% | 5.87% | 7.02% | 8.54% |
| **Male** | -4.10% | -12.59% | 8.11% | -11.36% |

**Table 5: Growth in parameters based on gender**

**CONCLUSION**

With tracing the growth patterns, it can be summarised that women have reportedly adapted better in comparison to men when it comes to adapting to the tools of virtual learning. They respond

better to the interaction levels, possibly breaking the online barrier to communicate more often than men in an online session. Women also reported enjoying these sessions more than men, surprisingly in a time when the work-life balance has been a talking point across the world. Being primary caregivers and in charge of domestic tasks, working women have been relying on the force of house help, in handling work and home simultaneously. But working from home opened several possibilities for women and helped them multitask as well. This could also explain the comparable attention spans in women as well as in men. Lastly, the perceived effectiveness of the workshop was much higher in women than in men. While the number in participation reflects the disproportionate access to technology in various sections.

Thus, it can be concluded that women have adapted better to technology in case of the education industry, facilitating a smooth teaching and learning process. The results find a semblance in results with a report that stated that women use the internet for more educational purposes and men use it for recreational purposes, and this stands true even in the case of the covid induced lockdown. A report correlates gender equality in society to gender participation in the digital economy and suggests that growth in either of them would lead to a societal change (EIGE, 2020). The anonymity and deindividualization the virtual tools offer, help them in looking beyond gender to represent themselves better. The loss of self-awareness that comes with social situations helps women to focus more on the teaching-learning process (Jaidka et al., 2022).

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