Digitalization Of Teaching Learning During Pandemic: Emerging Opportunities In Post Pandemic Era

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ARTICLE INFO	ABSTRACT
	Acquiring ICT infrastructure, digitalizing the off-line content, adopting synchronous/ asynchronous/ blended learning and implementing online assessments were some of the prevalently observed trends during the pandemic. The state of continuation of these trends and the opportunities they created in post pandemic time are still unexplored completely in Indian higher education. This study aims to address this gap by conducting semi-structured interviews with academics from 13 Management institutes. Thematic Analysis was used to explore faculty impressions. Findings indicate that post-pandemic, online classes persist as needed, and some institutes sustain the utilization of ICT infrastructure for teaching and administrative tasks. Despite challenges, the study uncovers several opportunities stemmed from the continuation of these trends.

Introduction

The arrival of a 'need' often sparks transformations in both people and processes. One such profound need arose with the onset of the COVID-19 pandemic, prompting a shift in Teaching and Learning (TL) from traditional face-to-face to online modes. This shift compelled educational institutions to swiftly embrace various digital tools and technologies to facilitate online TL, including training faculty and students in their usage, digitalizing study materials, conducting online assessments, and utilizing Learning Management Systems (LMS), among others. While these trends in TL existed prior to the pandemic, their widespread adoption occurred primarily in response to the crisis, leading researchers to aptly term them as 'pandemic teaching learning trends' in this study.

During the pandemic, institutions, faculty, and students, regardless of their level of preparedness, underwent abrupt digital transformations in TL practices. This study aims to shed light on faculty experiences concerning the evolving trends in TL during the pandemic, examining whether these trends persist post-pandemic and in what capacity. Furthermore, it seeks to explore the various opportunities that have emerged as a result. By presenting the outcomes of pandemic TL trends in the post-pandemic era from the faculty's perspective, this paper contributes significantly to the existing literature. Subsequent sections provide a conceptual understanding of the trends associated with the digital transformation of TL during the pandemic.

Literature Review

The section provides conceptual clarity on several trends of TL observed during pandemic while it also touch base the findings of previous studies on these aspects.

Digital Transformation of TL

Digital transformation encompasses the influence of digital technology on various aspects of human life (Stolterman and Fors, 2004). In higher education, digitalization involves the adoption of ICT infrastructure and digital technologies for Teaching Learning, Assessment, Communication, Administration, Support Services and Research (Jakoet-Salie and Ramalobe, 2022). Specifically, in TL, digitalization entails using

technology for synchronous classes, online learning, e-content creation, blended learning, online assessments and utilizing LMS (Thakur and Kukul, 2022). A glimpse on these concepts is provided below-

Online teaching involves real-time audio or video interaction between teachers and students, offering a promising alternative when physical attendance isn't feasible (Arbaugh & Hwang, 2013). During pandemic, platforms like Google Hangouts Meet, Slack, WebEx, Zoom, and Cisco, alongside customized cloud-based learning management systems such as Moodle, Skype, and Big Blue Button were increasingly utilized (Stanistreet et al., 2020; Thakur and Kukul, 2022) to facilitate online learning. In this context, instructors observed to play a crucial role in course design, empathy and responsiveness who also face several challenges like student disengagement, student focus, internet disruptions, limited experiential learning and assessment supervision issues (Younis and Elbanna, 2022). On the other hand, success hinges on various factors, including student attitudes, self-regulated learning, internet self-efficacy, institutional commitment, student-faculty interaction, planning, instructor presence and availability of facilities (Das and Bhuwandeep, 2021).

The online learning manifests in Synchronous and Asynchronous forms where the former involves live interaction between students and instructors via audio or video conferencing while the latter features time gaps where instructors send recorded materials for students to review at their convenience (Arbaugh & Hwang, 2013). With regard to their effectiveness, studies reveal that synchronous learning give better student outcomes compared to asynchronous classes. However, the former has got its challenges such as internet connectivity issues, no ownership of devices and student disengagement (Rao and Vijayalakshmi, 2022).

There is one more type of learning called 'Blended Learning' that aims to supplement traditional in-person classes with online components. During pre-pandemic, it involved a mix of digital technologies and traditional classroom methods, but in pandemic era, it shifted to a combination of online and face-to-face teaching (Rosenbusch, 2020). Research indicates that blended learning boosts student engagement and satisfaction, offers flexibility for both staff and students and proves cost-effective. However, it's challenges include staff capacity to engage, resistance to change and infrastructure and technical support issues (Truss and Anderson, 2022).

Learning Management Systems and Digital divide
Amidst the widespread transition to online learning during the pandemic, LMS played a pivotal role in maintaining student engagement and facilitating uninterrupted learning (Veluvali and Surisetti, 2022). LMS is described as a web-based platform that provides instructors with tools to plan, evaluate, automate administration, report training events, and implement the learning process (Ellis, 2009). It enables users to upload learning content, create timetables, schedule classes, track attendance, make announcements, conduct assessments, upload marks, and map program and course outcomes, among other functionalities.

However not all institutes adopted LMS due to financial and technical constraints.
Institutions' experiences with digitalizing TL vary based on their pre-pandemic ICT infrastructure status. Those already using LMS faced fewer hurdles in transitioning online, benefiting from existing familiarity with technology (Stanistreet et al., 2020). Conversely, less privileged institutions, unaccustomed to ICT beyond basic tools, encountered greater challenges. Similarly, economically disadvantaged students faced barriers due to limited access to smart devices and internet connectivity (Pokhrel and Chhetri, 2021), leading to the emergence of the 'Digital Divide'. This divide extends beyond technology access, encompassing the inability to integrate digital tools into meaningful practices and derive benefits from them (Iivari et al., 2020). Notably, those lacking infrastructure and technical support experienced disruptions in their learning, underscoring the profound impact of the digital divide on academic progress (Younis and Elbanna, 2022).

Focus of Research
Previous studies predominantly focus on the effectiveness and challenges of TL trends during the pandemic, leaving a gap in understanding their implications in the post-pandemic context. To address this gap, this study aims to answer the following research questions:
1. What trends were observed in TL during the pandemic and are they still being continued?
2. What opportunities did pandemic TL trends create in the post-pandemic era?
3. What challenges now the institutes face to continue the pandemic TL trends?

Research Methodology
In finding answers to the research questions, the following methodology was adopted, described below

Sampling framework
To address the research questions, data were collected from 13 management institutes in South India, selected using a saturation-based approach that stops data collection when no new information was found (Guest (Guest et al., 2006). Out of 13, six institutes were proactive in technology integration with Teaching and Learning (TL) before the pandemic, while seven had minimal prior technology usage. The heterogeneous

nature of these sample groups was deemed appropriate to provide comprehensive insights to the research questions. Department heads, actively involved in TL and managerial processes during and post-pandemic, were chosen as respondents. Thus criterion-based sampling approach resulted in a sample size of 13 respondents.

Data Collection – Instruments and Analysis
To investigate the research questions in depth, a qualitative approach was employed, conducting semi-structured interviews with sample respondents. The interviews consisted of three questions: first, exploring faculty experiences and practices related to TL trends during the pandemic; second, assessing whether institutes continue pandemic TL trends presently; and third, focusing on challenges and opportunities observed in continuing these trends. The interview questions were reviewed by four senior professors from reputable institutes. Interviews were conducted over the phone with consent and lasted 20 to 35 minutes each. Audio recordings were transcribed verbatim within 24 hours. Thematic Analysis (TA) approach (Braun & Clarke, 2006) was utilized to analyze the data, identifying key variables and concepts as coding categories based on research questions and later codes were sorted in to various themes until a consensus was reached (Zhang & Wu, 2022).

Results and Discussions

Of 13 respondents (management faculties), eight were males and five females. Their mean age was found to be 41 years and all of them are with terminal degrees (doctorate). Six of them were specialized in Marketing, four in Finance and three in HR and their average teaching experience was found to be 13 years.

1. Faculty Experiences towards Trends in TL During Pandemic
Faculties were asked to share their experiences with regard to trends observed in TL during the pandemic. Following are their impressions-

Acquiring ICT for online teaching: Not all management institutes were well equipped with ICT infrastructure. Few institutes didn't even had a Wifi enabled campus. In order to hold online classes they had to rush towards acquiring license from virtual meeting apps first. In this regard one of the participants shared, *"Initially, management preferred free versions of virtual meeting apps like ZOOM or Google Meet. However, due to their limitations, they later purchased licenses for Microsoft Teams to ensure uninterrupted online classes, resulting in app-switching and confusion." (p2).*
As institutes gradually reopened during the second phase of pandemic, only faculty members were asked to attend the institutes on a rotational basis, meanwhile, students continued learning from home. Institutes adapted LMS for administrative purposes and upgraded campus infrastructure with Wi-Fi's, projectors and smart whiteboards to enhance online education delivery. A respondent noted *"We needed smart devices and reliable internet for online classes then. Some colleagues couldn't afford due to half salaries"* (p7). Not only just acquiring ICT, the management also had to train faculty in virtual apps, *"We received excellent training from the institute, with additional assistance provided by the technical team over the phone whenever needed." (p8).* While an interviewee shared, *"I became a student while learning virtual platforms. Sometimes, my students helped explore features. However, retiring faculty faced major learning challenges" (p10).* While a few faculty had a rollercoaster journey learning new apps, this wasn't the case for those in premier institutes with well-equipped ICT infrastructure prior to the pandemic. A couple of respondents shared, *"We used 'InPods Inc' LMS even before the pandemic, but fully utilized its features only during the pandemic." (p11). "For us, ICT integration with TL existed even before the pandemic. The only new addition during pandemic was online classes." (p13).*

Digitalizing study materials: Practices in digitalizing content, such as creating PPTs and converting physical material to e-content, were observed. In this regard a participant stated, *"As a business statistics instructor, I relied on chalk-and-talk pedagogy. Transitioning to online teaching posed challenges, particularly in preparing PPTs. Converting physical study materials into digital format was labor-intensive and time-consuming." (p5).*While the other respondent replied *"Our approach of digitalizing the content was different. We recorded faculty sessions at college premises with high-quality devices and shared them with students in advance for pre-class review." (p3).* Overall, the respondents who relied on chalk and talk pedagogy during pre pandemic phase admitted that they did face difficulties in digitalizing the content.

New approaches in retaining students' attention: The context of face-to-face teaching differs from online mode, which presents challenges like internet disconnectivity, limited supervision, student disengagement, and reduced experiential learning opportunities. Respondents shared their initiatives to address these challenges. *"Instead of just running through PPT's I included conceptual videos and simulation exercises in between and posed questions on the same to keep up students' focus" (p6).* The other interviewee replied *"I incorporated quizzes throughout the session, assigning marks to student performance. This incentivized approach made them focus during class." (p5).* An academician employed

flipped classroom model. He said, *"I shortened class duration from 50 to 30 minutes using a flipped model. Assignments and case studies were provided beforehand, and class time was dedicated to interactive discussions, ensuring focused engagement."* (p3). While the other respondent used the 'Hot-Stove-Rule' to bring discipline. He shared, *"I employed attendance marking to track attentiveness, combating disengagement by calling out enrollment numbers for participation. Only those who answered questions received attendance, ensuring active participation and accountability." (p8).* From above impressions it is observed that faculty used rewards and punishments to motivate students to take part in learning process.

Adopting new assessment methods: Conducting assessments online posed significant challenges in evaluating students' knowledge and performance. Academicians had their own approaches such as - *"We relied solely on objective mode and situational analysis through case studies due to limitations during the pandemic."* (p1). While the other replicated the assessment format of face to face in online mode. *"We adopted a standard format with online subjective questions, students uploading answer scripts on LMS within a time limit. Students were required to have their videos on for faculty observation."* (p12). The other respondent taken technology help. He said *"we used proctor technology that automatically logs out students from an exam whenever they attempt to open another window"* (p7). One of the interviewee said *"They gone for open book exam to overcome the challenge of malpractice"* (p4). Few institutes had postponed the exam to next semester.

2 Continuing Pandemic TL Trends in Current Context

Respondents were asked if they continued the TL reforms implemented during the pandemic. Respondents varied in their continuation, *"We returned to face-to-face classes, but utilize online classes during institute closures due to natural calamities or political constraints. Additionally, we conduct online classes after working hours for syllabus completion when necessary"* (p2). Institutes are making use of ICT infrastructure acquired during the pandemic for various purpose. *"We initiated classroom recording during the pandemic and continue to do so, storing daily sessions in a repository. This allows students to access missed or review sessions at their convenience."* (p3). The other respondent replied, *"Post-pandemic, our institute utilizes newly acquired ICT infrastructure like projectors and a Wi-Fi enabled campus for video-based learning and online simulations."* (p12). Pandemic accustomed the academicians to technology integration with education. An interviewee shared, *"We are continuing using LMS in our institute. Attendance, assignments, course materials, announcements are now done through LMS"* (p8). Apart from these, academicians encouraged students to register for online courses (offered by third party vendors) during the pandemic. On this trend, an interviewee responded, *"We're continuing to enroll students in domain-specific and multidisciplinary certificate courses offered by third-party providers like Coursera, edX, etc., to enhance their understanding of contemporary topics."* (p1).

3. Opportunities with Continuation of Pandemic TL Trends

The pandemic catalyzed revolutionary changes in TL trends, driving educators to integrate technology, enhancing ICT infrastructure in institutes, and rapidly increasing tech literacy. This created numerous opportunities, as shared by one respondent: *"Management students now easily connect with industry experts online, crucial for gaining industry insights. Post-pandemic, arranging guest lectures has become simpler via ICT."* (p13). Not only guest lectures, but a trend of conducting hybrid model of professional development programs has started. An academician says *"We're conducting professional development programs in a hybrid format, combining face-to-face and online sessions. This broadens audience reach and allows participants to develop skills without disrupting daily routines."* (p7). On the other hand, a new approach in distance education program is observed post pandemic. *"Distance programs have evolved with the advent of online courses. Institutions are increasingly offering these programs online, leading to a surge in enrollment. The pandemic's embrace of online teaching debunked its perceived ineffectiveness, showcasing its efficacy in delivering education"* (p1). Adding to this notion, another respondent opined, *"The distance management education program is innovating its delivery by supplementing study materials with pre-recorded session videos, simulations, and educational videos. Weekly online classes have replaced face-to-face sessions, leading to increased student attendance"* (p3). Not only that, even International collaborations are happening through online mode. As a result the cost of such collaboration has come down drastically as there are no travel and accommodation expenses involved. One of the interviewee said, *""Online classes enable faculty from other countries to engage with management students, offering valuable international exposure. Cost reduction is prompting more institutions to establish such partnerships, leading to an increase in online tie-ups"* (p12).

Despite institutions facing closures due to environmental calamities and political constraints, education continues without interruption. Online classes emerged as a viable solution in such scenarios. An academician reflects *"Before the pandemic, institutions closed due to political and environmental constraints, forcing us to halt education until reopening. However, post-pandemic, we leverage our experiences to continue education online"* (p10). A shift in students' learning approach is evident. An

academician notes "*Students now rely less on faculty, becoming more adept with technology and exploring various digital information sources, fostering self-learning habits*" (p6). Additionally, 'pandemic-induced reforms' created new employment opportunities for faculty. An academician p(8) shares examples of colleagues earning from YouTube channels and conducting online professional development sessions, attributing these initiatives to lessons learned during the pandemic, which encouraged faculty to explore and utilize their capabilities.

4 Challenges in Continuing Pandemic TL Trends

Faculty and students express resistance to continuing pandemic teaching and learning trends. One respondent p(10) notes that some faculty, particularly those over 45, resist integrating technology into teaching, viewing it as interference rather than integration. Another respondent cites p(2) concerns over the cost of maintaining technology, preferring traditional file management systems and in-person teaching methods. Additionally, faculty and students find online teaching distracting and burdensome, particularly due to home disturbances. Overall, both groups prefer face-to-face teaching, citing cost constraints and reluctance to adapt to online methods.

Conclusions

Our study identifies key trends in TL during the pandemic and their current implications. Institutions swiftly acquired necessary technology, both hardware and software, enabling online education. This included high-bandwidth WiFi, laptops, smart boards, projectors, and licensed virtual teaching platforms like Microsoft Teams and Zoom, as well as administrative systems like LMS. This technology facilitated faculty training, development of e-content, and adoption of innovative teaching methods such as flipped classrooms, conceptual videos, and interactive assessments like online tests and proctoring technology.

In the present context, online classes continue as needed, with some institutes embracing ICT infrastructure for teaching and administration. This trend has created opportunities and challenges. Both faculty and students have become more tech-savvy, with faculty generating new income streams through social media teaching channels and online lectures, while students engage in self-learning through external courses. Stakeholders readily shift to online teaching during crises, ensuring uninterrupted education and benefiting from broader outreach and cost reductions. Traditional distance learning programs transition to online formats, attracting more students and gaining wider acceptance. While on the other hand, challenges include resistance to online learning from few faculty and students, as well as maintenance costs for technology. Nevertheless, the crisis has spurred significant advancements in the education system, demonstrating adaptability and resilience.

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