From Studios to Laptops: Challenges in Imparting Design Education Virtually

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Abstract
This paper investigates challenges faced by design educators when force shifted from traditional studio-based teaching to online modes of education due to covid-19 caused lockdowns [1]. This paper discusses suitable features of different online platforms used by the design educators, in depth interviews with design educators and survey findings from students who undertook classes. The findings suggest available online education tools used by the design educators were not found to be suitable for design education and in light of the findings, this paper suggests modifications that can be made to designs of online education portals so that they can cater to design education in a more efficient manner.

Keywords
E-learning; Design education; Studio based learning; Virtual classrooms; Online Teaching challenges

Introduction
In the wake of the covid-19 pandemic, many countries have observed a long period of lockdown. This has resulted in an unprecedented use of online media for design education. Though online education has existed for a long time in design [2], a newfound relevance has emerged due to the lockdowns. This requires a fresh investigation, particularly for the studio-based design

courses. This paper has looked into the platform affordances, student perspectives and educators' experiences.

Research Methodology and Observations

The study was conducted in three parts, first online platforms were analyzed for the features they offer, then a survey was conducted with students who recently took online design courses and finally in-depth interviews were conducted with design educators who conducted courses during the lockdown using online platforms. In the first step, it was identified through discussion with educators and students that three most popular online platforms used for education in India were Zoom, Microsoft Teams and Google Classroom. A tabular comparison of features has been presented in figure 1.

No.		Google Classroom	Microsoft Teams	Zoom Classes
1	Maximum number of users	250	250	1000
2	Accessibility from all devices	☑	☐	☑
3	Compatibility with different OS	☑	☑	☑
4	Easy account management/accessible through all accounts	☐	☐	☑
5	Sharing of documents like lecture notes	☐	☑	☐
6	Quick assignment process	☑	☑	☐
7	paperless assignments	☐	☑	☐
8	Can add comments/Post its to a lecture	☑	☑	☐
9	Scheduling/Calendar	☑	☑	☑
10	Integration with Notes/Docs	☑	☑	☐
11	Automated Quizzes and tests	☑	☑	☐
12	Quality of video and audio	☐	☑	☑
13	Co-visibility of users	☐	☑	☑
14	Learner sharing - with each other	☐	☑	☐
15	Live chats with the teacher and peers	☐	☑	☑
16	Virtual backgrounds	☐	☑	☑
17	Live whiteboards/screen share	☑	☑	☑
18	Easy to use interface	☑	☑	☑
19	Privacy issues	☐	☐	☑
20	Freezing of screens	☐	☑	☐
21	Recording option of a lecture	☐	☑	☑

Figure 1: Internet-based comparison of features of popular online portals used for design education in India

Next, based on the findings of content analysis of online reviews posted by users of these online platforms, a survey was designed to investigate how design students in India are interacting with these platforms. The survey was taken through an online form. 36 students (18 male and 18 female) from India enrolled at the university level in design courses of architecture, product design, interaction design, fashion design and visual communications participated in the survey. The age group of all students was between 18-25 years. 33 out of 36 students had used either of Zoom, Microsoft Teams or Google classroom for their online design class. Findings of the survey are tabulated in table 1.

No	Findings
1.	The design classes were typically of duration more than 1 hour and sometimes more than 2 hours (32/36 responses).
2.	Students preferred live demonstrations and interactive lectures over recorded tutorial videos and notes (33/36 responses).
3.	Most of the students preferred to keep their video off during the class due to low internet bandwidth (28/35 responses).
4.	Most students used a laptop for their class versus a tablet or a mobile phone (26/36 responses).
5.	Most students could not use the option of forming smaller teams for group-work in the class (27/36 responses).
6.	The option of screen sharing was used mostly to make presentations or to demonstrate use of a design software (22/36 responses).
7.	Mostly assignments had to be uploaded or emailed as scanned or pdf files for assessment and they could not submit it directly through the platform (31/36 responses).
8.	Due to low internet bandwidth, the problem experienced by most students were freezing of screens, loss of instruction during live lectures and dropping of video call (31/36 responses).

9.	Marking attendance was not automatic and students marked it through chat boxes or by taking screenshots (32/36 responses).
10.	The most useful features in the present online platforms reported by most students were: screen sharing (35/36), session recording (33/36), chat boxes (33/36) and the ability to mute the participants by the host (30/36).
11.	The main problems experienced by most participants were freezing of screens (32/36), Echoes or lag in audio (32/36) and simultaneous sound from participants (31/36).
12.	The most desirable outcome of online design education reported by most participants was the accessibility of classes at all locations while the least desirable outcome was loss of physical connection between students and teachers and lack of practical hands on experience of working on a design project.

Table 1: Findings from the online survey of university level design students who took online design classes

Finally, semi-structured interviews were conducted with six design educators, 4 males and 2 females, who are currently taking online design classes to understand the pain points and desirable impacts of using online portals to impart design education. The interviews were conducted telephonically, and the duration of the interview ranged between 20 to 35 minutes. The average duration for all 6 interviews was 28.6 minutes. The average age of the participants was 33 years and the average experience of working in design education sector was 6.2 years. The participants were teaching in the domains of architecture (2/6), interaction design (2/6) and fashion design (2/6). The key findings form the interviews are listed below:

1. **Attendance:** All 6 educators emphasized on the need to mark attendance and its difficulties. While the platforms generally record a list of participants, the instructor is unable to keep a track of 'actual' attendees. The main reason for this is the lack of internet bandwidth, due to which participants keep their video off and also get logged off and on during the class.
2. **Assignments and assessments:** All 6 educators reported that since most design assignments are practical works, their online submission and assessment is problematic. One issue is the upload and download of multiple large sized scanned files especially with low internet bandwidth. Second, they also reported that online assessments do not allow for interactive critiques where the teachers explain the students how they observe an error and then discuss about various ways in which it could be rectified.
3. **Group work:** 5 of 6 educators reported that they didn't use the option of making student teams for group work on the online platforms because, the automatic formation is random unless selected manually, which is a very tedious task. Besides, they are not able to retain the same teams for the next session.
4. **Live Demonstration:** 4 of 6 educators reported that a live demonstration of the design process doesn't happen naturally online because the instructors have to keep in mind other things like camera angle, lighting, poor video quality, audio lags etc. They also reported that recording and uploading the process as a video tutorial is very tedious and time-consuming.
5. **Student presentations:** 3 of 6 educators reported that online medium doesn't allow relay of soft-skills to students, where they are taught the art of presenting their designs to a client, learn the value of getting critiques and

experience the growth in their thought process through peer review and interaction.

6. **Types of users:** 3 of 6 educators reported that instructors and students were not the only users of the ongoing online design classes. Teaching assistants (from the instructor's end) and student assistants (family members of students who helped with technology) were also important players of online design education platforms.

Discussions and Conclusions:

This study finds relevance amidst the leap towards a global online design community, where design education can be imparted irrespective of the geographical location, besides dealing with rare situations like the covid-19 pandemic. This work is part of an ongoing study on how research through design can contribute towards online design pedagogy as well as to design features of technical tools which have become an indispensable part of the design curriculum.

Listed below are suggestions derived from the findings of this study:

Pedagogical suggestions: E-learning protocols may be made for design institutes which define/specify:

1. The roles of lead instructor and a teaching assistant - for additional tasks like managing interactions within students, formation of teams for group work, keeping a check on students' engagement during the class etc.
2. Maximum number of students in an online design studio - to ensure smooth conduct of the class and equal attention on all students.
3. Scheduling of queries (both online and offline) within a session - to avoid loss of queries due to echoes and audio lags.
4. Modes of presentation - new ways of making presentations online are required, besides the regular running of static or dynamic slides to focus of the soft skills of the students.
5. Use of external cameras - to demonstrate details of a design process as live demonstrations cannot rely on laptop cameras and mics.
6. Conduct of peer reviews.
7. Class timings depending on student location.

Technical suggestions: E-learning portals may incorporate the following features:

1. Automatic tracking of attendance based on the duration for which a student is logged in.
2. Plugged-in design software - with shared control between the instructor and the student.
3. Provision made for the role of an assistant who helps in managing class teams, assignments etc.
4. Recording of short timed sessions which are shared directly like lecture clippings.
5. Team management - provision to form non-random teams within the class which can continue through multiple sessions.
6. Assignment submission and assessment system - to avoid dependencies on other media like scanners and e-mails.

References:

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