Challenges and Opportunities in Online Learning among Freshman Architecture Students: Insights from India

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Abstract

The covid-19 pandemic stimulated the transition to online learning across all academic disciplines. However, this rapid transition brought about diverse experiences and unforeseen challenges. Several research studies highlight student's dissatisfaction with online teaching. The study aims to investigate the online learning experiences of freshman students in architecture.

Both qualitative and quantitative data are used for surveys and interviews in a mixed-methods study. The analysis reveals higher psychological and technical concerns among students, and a significant correlation between both parameters, emphasizing the importance of psychological well-being of students in online learning environment.

The study concludes that while online architecture drawing classes can be effective, students encounter significant challenges in this transition, and need additional support from their teachers and effective strategies to counter these challenges from their institutions.

Keywords: Online Learning, Online Issues, Architecture Drawing, Architecture Education, Covid-19

Introduction

The rapid shift to online mode of education due to the covid-19 evolved new challenges for architectural institutions. While theory-based subjects can be relatively easier to deliver online, education in the discipline of architecture presents unique challenges, particularly in its studio-based learning. Freshman students in architecture course face the added difficulty of learning to handle different types of drawing equipment in studio classes which makes the transition to online learning even more difficult.

This study provides insights into the experiences and challenges faced by freshman architecture students while learning through online mode, and analyses their perception of the effectiveness of online classes in architecture drawing subject. It therefore aims to investigate the influence of shift to online learning on the experiences of freshman students in architecture during the COVID-19 pandemic, with a specific emphasis on learning architectural drawing. The objectives of the study are:

1. To analyse the learning experiences of freshman architecture students during the shift to online learning, with a specific emphasis on architectural drawing courses.
2. To identify critical challenges and opportunities that students encounter when engaged in online learning for architectural drawing.
3. To offer actionable recommendations to better support students in the online learning environment

Theoretical Framework

Architecture education is traditionally centred around the design studio, which helps foster design skills, creativity, problem-solving, and gain hands-on and collaborative learning experiences among students (Salama, 2016). The sudden shift to online learning due to COVID-19 brought both challenges and opportunities, which compelled architecture schools to introspect their traditional methods of teaching (Olweny, Ndibwami & Ahimbisibwe, 2022). Understanding how the online environment can replicate the collaborative and creative aspects of the architecture design studio was a central concern for architecture schools, as the design studio had to be reimagined in the virtual space.

There are various theories and frameworks that relate to online learning that apply to architecture education. According to Ola et al (2009), incorporating active learning strategies such as problem-based learning, project-based learning, and case-based learning can help engage students and promote deeper learning. Swan (2001) argues that online courses can be equally effective in specific circumstances when there is clarity of design, student engagement, and active learning. Garrison (2007) put forth the Community of Inquiry (CoI) framework which includes three degrees of presence e.g. teaching, social, and cognitive. Cho (2023) argues that in the context of online learning, spatial presence is also crucial, as students' physical presence may influence how they learn. Archambault, Leary & Rice (2022) identify five pillars of online pedagogy which include building relationships and community, incorporating active learning, leveraging learner agency, embracing mastery learning, and personalizing the learning process. Garrels (2022) proposes an interactive and user-centered course design strategy that involves creating online courses that are engaging and interactive for students to promote student engagement and motivation.

Even though online learning is becoming increasingly prevalent in higher education, its implementation in architecture presents distinct challenges. Gilbert & Matthews (2021) point out that students may feel alienated when learning online. However, by interacting with affective online learning environments, they may be able to develop a sense of connectedness, which may balance the alienating effects of social distancing. He further argues that utilizing non-digital means similar to writing and drawing freely might improve the online experience. Architecture drawing subject provides a perfect example of using drawing as a tool for learning in Architecture, as well as a tool for self-expression.

Architecture students often struggle with effectively communicating and presenting their ideas, loss of the collaborative and sharing environment experienced in a design studio, and challenges in creating a suitable workspace at home, which impacts their focus and productivity during online classes (Kiang, Mark & Menez, 2022). Allu-Kangkum (2021) highlights some key challenges for architecture schools in adapting to online learning environments, which include lack of hands-on experience, difficulty in replicating studio culture, limited access to specialized software and equipment, challenges in delivering design critiques and feedback, inadequate internet connectivity and infrastructure, social isolation and lack of interaction, challenges in assessing design work, and inadequate electricity supply and internet/data affordability in developing countries. Cho (2023) notes that depending on their experience in physical classrooms, first- and second-year architecture students had significantly distainct remote learning experiences than third- to fifth-year students (Cho, Lee & Kim, 2023).

Literature Review

The Design studio provides a crucial learning environment in architecture education, facilitating active interactions between students and faculty (Werdiningsih *et al.*, 2023), and

fostering transformations in student's perspectives on the built environment (Tumusiime, 2013). Examining the history of epidemics, Fawzi Al-Nuaimi & Maki Mohammed (2022) notes that they turn cities and urban areas into desolate places. Although, COVID-19 created an unusual situation in which the availability of an online environment enabled a virtual world supporting online communication for both work and education in the unprecedented times.

Many studies, particularly those conducted in the pre-covid phase point towards the effectiveness of online learning in architecture. A study by Kvan (2000) provides findings that online learning facilitates collaborative learning and enhances student engagement in architecture courses. Bender & Vredevoogd (2006) discusses the integration of online education technologies to enhance communication, feedback, and collaboration in the studio environment. Niculae (2011) explores the assimilation of new technologies in architectural pedagogy, emphasizing the potential of virtual design studio to foster cooperation and diversify student's experiences. Saghafi et al. (2012) evaluates teacher and student perspectives of physical and virtual design studios, emphasising the importance of physical design studios while recognising the potential for hybrid learning environments. McDonald et al. (2009) demonstrates the effectiveness of online tools in enhancing the quality of working drawings in an engineering design graphics course. Soygenis (2010) studies how writing helps architecture students learn to sketch, which could be applied to online courses. Yu et al.(2022) highlight that though students experience positive learning experiences due to increased flexibility, further development and enhancement of online teaching tools is needed for architecture studios. Asadpour (2021), investigating the difficulties encountered by learners in online architectural design programs, highlights the importance of the e-studio as an activity-oriented space, and outlines a framework where students become self-directed learners and instructors function as consultants and facilitators.

Several studies, particularly during the covid and post-covid phase point towards the benefits in addition to difficulties in online learning in Architecture. Ramanujam et al. (2022) investigates student's perception of online classes across different disciplines, identifying challenges faced by students and recommending improvements. Iranmanesh & Onur (2021) and Ceylan et al. (2020) emphasize on student-teacher relationship, peer learning, technical issues, network connectivity, lack of privacy, and motivational aspects. Alnusairat et al.(2020) in their study of attitudes of architecture students towards online design studios in Jordanian universities reveal uncertainties and desires for more guidance and support from students, along with challenges such as technical issues, tutor's lack of skill in online teaching, and barriers in peer interaction.

George (2018) finds that online students perform similar to face-to-face students in terms of graphic quality, but noted that online courses lack the social dynamics present in traditional studio settings. Nubani & Lee (2022) conclude that students in online design studios have much lower scores than traditional studios, and stress the significance of a sense of classroom community in enhancing students' comfort levels and increasing academic motivation when learning online.

The literature review highlights the lack of development of online teaching tools in an architecture studio, insufficient hybrid learning environments, inadequate understanding of student's perceptions and challenges in online design studios, long-term consequences of online learning and social factors in the context of covid-19. Other challenges encountered by students are student-teacher relationship, peer learning, network connectivity, technical difficulties, lack of privacy, lack of motivation, and lack of concentration. The review therefore suggests that online architecture drawing classes present both challenges and opportunities for architecture students. Moreover, there are limited studies on the effectiveness of online learning of architecture drawing, particularly among freshman students.

Research Methodology

A mixed-methods approach combining online surveys carried out through Google forms and interviews conducted through Google meet was used to collect qualitative and quantitative data on student's experiences with online classes in learning architecture. The

student cohort was 37 freshman students of architecture studying in the undergraduate course in Jamia Millia Islamia university in New Delhi, India. The students were taught architecture drawing subject for a semester through online mode by the first author, and online responses were collected at the semester end to analyse their experiences.

A pilot study was first conducted to gain insights into the actual challenges faced by students. The data was collected online by distributing an open-ended questionnaire, which included participant's name and gender, questioning their interest in class, and reasons for having or lacking interest. The study further investigated the issues and problems faced by participants during online classes, student's thoughts on resolving these challenges, and their attempts to tackle the problems. The information gathered in the pilot study served as a foundation for further research on online classes and student experiences.

A content analysis of open-ended responses obtained from the pilot study was performed to extract keywords that primarily focused on student's concerns regarding online issues. The keywords obtained related to issues such as lack of understanding and motivation, peer learning, interest, interaction, and concentration. Based on the keywords, four distinct parameters were identified and a closed-ended questionnaire was designed to assess student's perceptions of online architecture drawing classes, their degree of engagement with the instructional resources, and the availability of resources.

The parameters identified were technical issues, academic issues, psychological issues, and teacher related issues. The technical issues parameter addressed challenges related to handling equipment for making drawings, internet connectivity problems, and microphone issues experienced during online classes. The academic issues parameter explored the impact of online classes on student participation, teacher-student relationships, doubt clearance, and productivity. The psychological issues parameter focused on health issues, hesitancy, and reduced confidence in online classes, as well as the perception of offline classes as a better option. The teacher related issues evaluated student's coordination by teacher, their exploration of student mistakes, and quality of learning provided in online classes. A set of questions were developed for these four parameters on a Likert scale of 1 (strongly disagree) to 5 (strongly disagree). The online questionnaire was distributed and responses were received from all 37 freshman students studying in the class.

Table 1. Development of Questionnaire
Source: Authors

Parameters	Indicators of Online issues among Freshman Students
Demographics	Name Gender
Technical issues	Difficulty in handling equipment Connectivity issues Microphone problems
Academic issues	Encouraged to participate in class Improved teacher-student relationships Doubts remain Enhanced productivity
Psychological issues	I face health issues due to online classes Hesitation and lack of confidence Appreciation for offline classes
Teacher related issues	Coordination with instructor Instructor able to point mistakes Instructor able to provide quality instructions

Open-ended interviews were also conducted with a smaller sample of five students from among the class to gain further insights into their experiences and challenges with online classes.

Results and Findings

In order to analyse the data, mean and standard deviations of the parameters were calculated. Psychological issues obtained a higher mean score of 3.61 (SD = 0.85), indicating a relatively higher level of concern among students, followed by a moderate level of concern for teacher related issues M= 3.23 (SD = 0.78) and technical issues M=3.06 (SD = 0.85). Students showed a relatively lower level of concern for Academic issues M= 2.56 (SD = 0.74).

Table 2: Descriptive statistics of parameters studied
Source: Authors

Parameters	Mean	Stdev
Technical Issues	3.06	0.85
Academic Issues	2.56	0.74
Psychological Issues	3.61	0.85
Teacher related Issues	3.23	0.78

The findings reveal that participants were most concerned about psychological and technical issues, highlighting the importance of addressing the psychological well-being of students in the online learning environment. The study further stresses on efforts to improve technical support and address any issues related to teacher-student interactions. In the informal interviews, it was found that students experienced difficulties regarding engagement in online classes, interacting with teachers, doubt resolution, and productivity in work.

A Pearson correlation test revealed a strong correlation (r = .56, p < .001, n = 37) between technical and psychological issues. The results indicated that as technical issues increase, psychological issues also tend to increase significantly. The relationship between teacher and academic issues among first-year B.Arch. students revealed a moderate correlation (r = .36, p < .001, n = 37). The findings indicate that as teacher related issues increase, academic issues moderately increase.

Table 3: Correlation Matrix of Parameters identified
Source: Authors

Parameters	1	2	3	4
Technical Issues				
Academic Issues	0.137			
Psychological Issues	0.562	-0.132		
Teacher Issues	-0.054	0.360	-0.328	

The survey results show that students reported psychological issues such as reduced confidence and difficulties adapting to the virtual format. Students often felt disengaged from the course materials and missed the interaction with peers and instructors. While few students found online classes to be effective, most encountered technical difficulties in learning architecture drawing online. Lack of access to drawing equipment, difficulty of replicating physical drawing techniques on a digital platform, and limitations of software and hardware were cited as major challenges. Academic issues, such as limited interaction with peers and teachers, as well as productivity concerns were commonly experienced. Moreover, there were concerns relating to teacher-student relationships and the quality of learning.

Conclusion

The study provides insight into challenges that first-year B. Arch students encountered in transitioning to online learning environment during the COVID-19 epidemic. It identifies gaps in the development of online teaching tools, need for hybrid learning environments, and a deeper understanding of student perceptions and challenges. The data analysis revealed that students expressed their highest levels of concern regarding psychological and technical issues,

emphasizing the critical need to address their psychological well-being for a successful online learning experience. The findings also emphasize on the importance of improving technical support and enhancing teacher-student interactions. As learning architecture drawing poses various challenges for students who are new to using tools like parallel bars, studio tables, and different types of pencils, it is essential to observe how students utilize these instruments in their classes. To enhance student support, teachers should reach out to students who experience a significant drop in performance. It is preferable for teachers and students to establish informal modes of communication. The informal interviews uncovered additional challenges such as participation in online classes, student-teacher relationships, doubt clearance, and productivity at work. These concerns should be taken into account when designing online architecture courses. A high positive correlation between technical and psychological issues suggests that addressing technical challenges can significantly contribute to reducing psychological concerns among students. Similarly, enhancing meaningful teacher-student interactions can also moderately address academic concerns.

The study also revealed that though online studios are flexible, they often lack the social dynamics found in traditional settings, which influences academic motivation. Architecture institutions should therefore actively engage in prioritizing the psychological wellness of students by emphasizing encouragement, clear direction, and effective workload management. Institutions should also focus on fostering meaningful teacher-student interactions, making curriculum more adaptable to online learning, and enhancing technical support. Supplementing online learning with offline classes in a hybrid learning environment, which also facilitates face-to-face interaction, can enhance the overall learning experience. These strategies may help institutions improve the effectiveness of online architecture drawing classes.

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