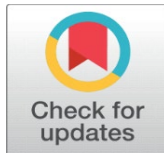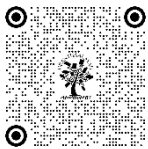# ONLINE TEACHING IN ARCHITECTURAL EDUCATION: A BOON OR BANE?

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ABSTRACT

The rapid advancement of technology has led to a paradigm shift in the field of education, and architectural education is no exception. The advent of online teaching methods has opened new possibilities and challenges for both educators and students. The integration of online teaching methods in architectural education has sparked considerable debate. This study examines the advantages and drawbacks of online learning, drawing insights from both faculty and student perspectives. Through a comparative analysis of the response from faculty and student survey from various architecture colleges in India, this paper aims to shed light on the key factors that determine the feasibility of online teaching in architectural education. Through comparative analysis, authors explore the impact of virtual classrooms on teaching standards, student engagement, and overall learning outcomes. These findings shed light on the following key aspects: Flexibility and Adaptability, Effective Communication, Assessment Strategies, Technological Challenges, and hybrid approach.

Keywords: Online Teaching, Architectural Education, Technology, Learning Outcome, Blended Learning

1. INTRODUCTION

Architectural education plays a pivotal role in shaping skilled professionals who bridge the gap between creativity and practicality. It encompasses a holistic blend of skills, knowledge, and values (Dutton, 1987). Online teaching in architectural education has gained prominence due to the evolving global practice of architecture. Researchers have explored various approaches, including critical inquiry-based, process-based, design-build, and digital technologies-based methods. Additionally, the recent shift from physical design studios to virtual design studios, driven by the Covid scenario, has further shaped architectural pedagogy (R Khan & Thilagam, 2023). Online teaching is a feasible option in architectural education, it provides option for mature age student (student having work commitment and family responsibility) to complete the degree regardless of their geographical location (Yu et al., 2022). Social transformation, climate change, globalisation, urbanisation, and the ensuing depletion of existing environments are just a few of the many challenges facing architectural practice and education and Students in higher education must be prepared to respond to

these challenges with the necessary knowledge and skills due to the new paradigms in architecture and urban design (Milovanović et al., 2020).

Academic programs—including architecture—have rapidly shifted to being offered online as a result of the COVID-19 pandemic. Three crucial elements have been highlighted in studies that have examined this shift: student feedback, blended learning, and adaptation. The institution implemented online learning successfully despite challenges. Teachers quickly adapted to digital platforms and tools. While certain students expressed satisfaction with online instruction, there were problems with the design studio courses. It is essential to use digital tools more frequently. The future of architecture education lies in blended learning, which mixes online and in-person instruction (Varma & Jafri, 2021).

Aim of the study is to understand the stake of online teaching in architectural education in the contemporary times and its potential in future trends by understanding the current utilitarian aspects of the online teaching and learning practices being undertaken in selected architectural institutes., Conducting the current study helps in understanding the pragmatic issues in concerns of online teaching aspects in correlation with traditional practices pertaining to architectural education, However, adapting to the online mode of education is not in vogue as a policy framework in imparting architectural education but, institutes are practicing the online teaching in a desirable mode by integrating partially with traditional practices of teaching and learning. The challenges in imparting architectural education through online mode such as the requirement of one-to-one interaction in between teacher and student for continuous instantaneous feedback while teaching certain courses like architectural drawing & graphics, design etc. This paper also made an attempt to understand the complexity of such challenges and discuss the ways to address them.

Methodology: The study was initiated with documenting the traditional teaching & learning practices in architecture and the recent paradigm shift towards integrating online teaching. Comprehensive literature study on exploring strategies, advantages, disadvantages, issues & concern in online teaching and learning processes provided insights regarding the online paradigm applicable to the education field in general, but no specific study was found in the architecture education. The observed changing trend in imparting architectural education with blended learning mode since Covid lockdown and post-Covid scenario in the institutes where the authors are working triggered the interest in the introspection study. An inquiry-based analysis was made by circulating questioners to the selected 19 faculty members and 25 students across three various architectural institutes which facilitated the integration of online mode persistently. The selection of faculty was on the basis of teachers who taught during the Covid lock-down, teachers who are pro-active in blended learning mode of teaching, whereas selected students various batches such as one who admitted in the academic year 2020-21 the period of lock-down and subsequent batches who witnessed the noticeable transformation in teaching and learning processes in the form of integrating the online mode with the conventional mode of teaching and learning practices. The collected perspectives form students and teachers led to the inferences and recommendations.

1.1. IMPARTING ARCHITECTURAL EDUCATION - TRADITIONAL CONTEXT

Architectural education primarily imparting the required insights to the students to bring out the creative quotient in demonstration of design instincts. Balancing of technical understanding with artistic inclination in the design approach is the essential objective in architectural education. To communicate the conceived concepts and to demonstrate the articulation of spaces, complying with the set standards is the desired outcome.

In order to inculcate the required skillset for such demonstration, an array of subjects comprising various tracks such as design synthesis, communication and graphics, technical understanding, humanities, environment, digital tools etc., becomes the part of the curriculum.

Traditionally, all the subjects could be categorised into two broad categories namely theory and studio based. Wherein the theory subjects will be dealt in lecture mode and studio-based subjects is on focus group interaction mode.

Exploration on online resources and learning platforms for acquiring additional knowledge is in vogue since the commencement of 21st century. With the outbreak and uncertainly of Covid the teaching learning process started relying upon blended learning mode.

Despite facing challenges like upgrading the technical knowledge, acquiring skill to manage, monitoring the students etc., the process of online teaching gained prominence.

Architectural colleges in India do have affiliations with various institutions such as MHRD institutes. IITs, NITs, Government Universities, deemed to be Universities, Private Universities or architecture college functioning as Stand-alone Institutes. All the above-mentioned institutes may or may not be equipped with the required infrastructure to impart the online teaching effectively, however some of the universities sophisticated respective ICT infrastructure to facilitate online teaching during Covid context and being continued as one of the functioning teaching & learning practice since then because of the witnessed advantages such as flexibility in pace of learning, transparency in teaching and learning process from various stakeholders. The current study holds good for any architectural institute conducting online teaching and learning practices in India and abroad.

1.2. IMPARTING ARCHITECTURAL EDUCATION - CURRENT TREND

Paradigm of the online teaching and learning process triggered the vitalization of tools and platforms. Online learning made available through various faucets like digital learning, online learning and forum interaction, live interaction online, blended learning etc.

Each of these modes have specific tools. The prime objectives of these tools are

- Convenience in teaching and learning
- Student engagement
- Evaluation
- Tutorials

1.3. ADVANTAGES OF ONLINE TEACHING

Flexibility and accessibility: Flexibility of timing is the major advantage. A learner will be able to study at the time of convenience by keeping the required targets annexed.

Any person with internet access will be able to pursue online education. Around 53% of the world's population has access to the internet and around 49% of students across the globe have completed online learning (Peck, 2024). by 2022 India ranks 2nd in the world after the US for having maximum number of learners (World Economic Forum, 2022).

Cost-effectiveness: Cost and expenditure in terms of establishment, operation and maintenance in online education setup is very less in competition with the physical mode for both the service providers. Expenditure in terms of enrolment fee and exam fee is very minimal.

Diverse learning resources: Wide array of courses offered from various institutes and learning platforms across the globe provides a fair deal of choice to the aspirant to compare and select the course of ones choice w.r.t respective objectives.

Gender parity: According to coursera, the percentage of women opting for online learning increased form 38% to 45% within a span of two years i.e. 2019 to 2021, and 2022 report states that the gender gaps are "substantially smaller" in online enrolment in competition with traditional learning (coursera, 2021).

2. CHALLENGES AND CONCERNS IN ARCHITECTURAL EDUCATION
2.1. LACK OF HANDS-ON EXPERIENCE

Architectural education as a professional course demands hand-on experience in majority of the subjects to understand the practical aspects by preparation of scaled models, understanding the behaviour of building materials etc. Also, in the process of learning communication graphics during the foundation level, a thorough understanding on importance of line-weights and line-types is essential, and this objective could be achieved by intensive practice which requires constant feedback form the instructor over the table in one-one interaction mode.

Technical issues and infrastructure gaps: Inadequate digital tools and unstable internet connections are the two prominent challenges in online architectural education. Infrastructure gaps, like the absence of interactive studio environments, lead to a diminished educational experience. These limitations hamper collaborative and hands-on learning, which is central to architectural pedagogy. Furthermore, disparities in digital literacy among students cause

the divide, reducing the quality of learning outcomes. Addressing these challenges requires novel solutions that bridge the gap between traditional and virtual learning environments.

2.2. PEDAGOGICAL ADAPTATIONS

Student engagement and motivation: Real time online teaching as a substitute for imparting education in traditional process has a huge challenge of maintaining persistent concentration levels in the learners. Online teaching platforms introduced a lot of tools and provisions such as polls, quizzes etc., to engage the students and minimize distractions by floating the relevant technique during the meantime of scheduled class. Teacher must pre-set polls at required intervals by presuming the likelihood of distraction from the learner's end. An effective teaching and learning process always demands constant feedback among the learners and teachers especially through gestures exhibited, which is a huge challenge for online classroom mode unless the learners respond spontaneously through graphic interphase provided as the monitoring of all the students simultaneously giving the lecture is impossible. Learners have a provision to switch off the camera unless disabled from the main host, which leads to inability to monitor the student's presence. To tackle these challenges blended learning mode with flip-classroom approach is more appropriate for architectural education.

3. 'TRADITIONAL TO ONLINE' PARADIGM SHIFT OF PEDAGOGICAL STRATEGIES IN ARCHITECTURAL EDUCATION

3.1. INQUIRY BASED LEARNING

Encourage students' critical thinking and exploration. This approach helps students transition from traditional studio pedagogy to a virtual design studio environment, allowing them to adapt to the evolving global practice of architecture.

3.2. INTEGRATION OF DIGITAL TECHNOLOGIES

Use of software and digital technology will be helpful to streamline design process. Digital technology includes utilising simulation tools, virtual reality, and 3D modelling.

3.3. FLIPPED CLASSROOM MODEL

In flipped classroom model students complete assigned readings and other materials in advance before classroom group activities which facilitate experiential learning and offers immediate feedback.

3.4. SYNCHRONOUS AND ASYNCHRONOUS SESSIONS

Combination of synchronous(live) and asynchronous (pre-recorded) sessions allows students to access resource and assistance in spite of different time zone.

3.5. AUDIO-VISUAL TOOLS

Use of visuals to illustrate methods and concepts are effective. Videos, webinars, and tutorials are some of the effective ways to convey complex concepts in simple, understandable formats.

3.6. INTERACTIVE PARTICIPATION

Interactive online environments can engage students in discussions, workshops, and peer reviews which promotes collaboration and a sense of community among students.

3.7. ASSESSMENT ALIGNMENT

Online resources and learning objectives alignment with assessment methods will confirm the transparency, truthfulness and grasping quality of students and architectural principles application.

3.8. FEEDBACK MECHANISMS

Timely and insightful feedback is always crucial for students. Digital platform will be useful for to provide personalized feedback which will act as a aid for student development.

3.9. PEDAGOGY OVER TECHNOLOGY

Pedagogical concepts should get greater weight than the delivery methods. Adaptation to different learning styles and engage students in both online and offline learning environments can be considered as good teaching strategy

3.10. AUTHENTIC LEARNING TASKS

Students 'preparation for the challenges of the industry will promote the development of professional skills. For the architectural practice instructional task can be useful.

3.11. DESIGNING EFFECTIVE VIRTUAL STUDIOS

Effective virtual studios require the development of a collaborative, immersive environment that follows the design discourse's pedagogical principles. Remote student participation in design processes is facilitated by Virtual Design Studios (VDS), which promote experiential learning and creativity. The COVID-19 pandemic's capacity to adjust to VDS demonstrated the value of these platforms for continuing education. Using a hybrid approach that blends virtual capabilities with traditional studio methods, VDS can be incorporated into architecture education to enhance learning outcomes.

3.12. COLLABORATIVE LEARNING IN DIGITAL ENVIRONMENTS

In collaborative learning to improve instruction while encouraging dialogue and information sharing digital environments uses technology. It enables students to communicate both synchronously and asynchronously by overcoming geographical barriers

4. FACULTY PERSPECTIVES

- Experiences of architectural educators: A survey conducted comprising of professors, associate professors and assistant professors from several institutes imparting architectural education.
- 76.5% agree with online teaching has expanded the reach of architectural education.
- 82.3% agree with the opinion that online teaching provides opportunities for more flexible learning schedules.
- 64.7% agree with the opinion that online teaching hinders effective communication between faculty and students.
- 41.1% agree with the opinion that online teaching enhances student engagement through interactive tools and platforms, and another 41.2 % have fair agreement.
- 88.2% agree with the opinion that online teaching allows for better integration of multimedia content in lessons.

4.1. BENEFITS OF ONLINE TEACHING

The survey also accorded the list of benefits of online teaching in architectural education in terms of the factors such as,

- Flexibility of learning time
- Student Engagement
- Ease of resource sharing
- Expanded reach.

- Global knowledge sharing network.
- Reduces required expenditure.
- A simultaneous exploration feasibility to expand knowledge, skill development and more career options.
- Transparency in evaluation
- Accessibility - Online teaching offers accessibility, enabling students from diverse geographical locations to access architectural education without the constraints of physical proximity to educational institutions.
- Diverse Learning Resources - Online teaching provides access to a wide range of digital learning resources, including multimedia presentations, recorded lectures, and online forums. This diverse array of resources enriches the learning experience and caters to different learning styles, fostering a more comprehensive understanding of architectural concepts.
- Guest Lectures and Industry Connections - Online teaching allows for easier coordination of guest lectures and industry connections. Virtual platforms enable experts from around the world to deliver lectures or participate in discussions, providing students with valuable insights and networking opportunities within the architectural field.

4.2. CHALLENGES

Teaching fraternity in architecture do come across various challenges such as,

- Reachability and Access for all
- Updated skill set to use it.
- Connectivity issues
- Difficult to teach draughting skills.
- Difficulty in providing instant and constant feedback for design coursed which requires one to one interaction over the table.
- Demonstration of paper-based tools by students would be difficult.
- Student engagement
- Regulating the required pace of teaching with respect to receptance quotient becomes a huge challenge.
- Students become casual listeners.
- Conducting exams with proper monitoring

4.3. TRAINING AND PROFESSIONAL DEVELOPMENT

Constant skill development and upgradation of required technical expertise is a mandate for all the teachers. Enthusiasm to explore various available online teaching tools will yield benefits. Participation in the Skill development Programs focusing on digital tools in online teaching is highly essential.

4.4. BALANCING TRADITIONAL AND ONLINE METHODS

Blended learning is the most suitable approach among all the available online learning paradigms in architectural education. Designing the course content with a suitable comprehension of offline and online content brings in the advantage of flexibility in learning. Arranging online expert lectures of eminent architects from academia and profession will expand the horizons of learning and conserve the resources. Live streaming of construction practices with a provision of real time virtual interaction with experts on site is a good alternative for site visits whenever budget and logistics is a challenge.

5. STUDENTS PERSPECTIVE

Students from three universities have provided the opinions. The strategy of selection of sample comprises of admitted batches 2019-20 to 2021-22 to understand the response quotient regarding online education operations from pre-Covid circumstances, during; lock-down to post-lockdown scenario. Prior to Covid, students used to use online resources predominantly to collect secondary data. During lock down, a sudden paradigm shift to 'teaching and learning process only through online mode' consumed considerably longer duration for adaptation by both students and teachers. This paradigm shift could be observed in the institutes which could afford to create required infrastructure, train the teachers to equip required technical skills; unfortunately, because of Covid lockdown consequences many educational institutes were closed, and education had to face a huge offset. In architectural education, challenges like inability to provide required amount of personal interaction with students, feedback delivery and engagement, hands-on experiencing were faced. Teaching and learning community could able to experience and understand various pros and cons of online teaching process with respect to above mentioned challenges and convinced with the blended learning approach is the most suitable approach especially for architectural education.

Majority of the respondents communicated that video lectures, 3D modelling tutorials and live webinars could help predominantly among various other tools of learning such as discussion forums, virtual tours etc.

11% of the students stated that the online tools facilitated ones understanding of architectural concepts and design principles.

Majority of the students expressed flexibility and availability of variety of resources are the major advantages in online education processes. In addition, students also claimed that online learning has improved self-discipline and time management (Fig1: Survey by authors).
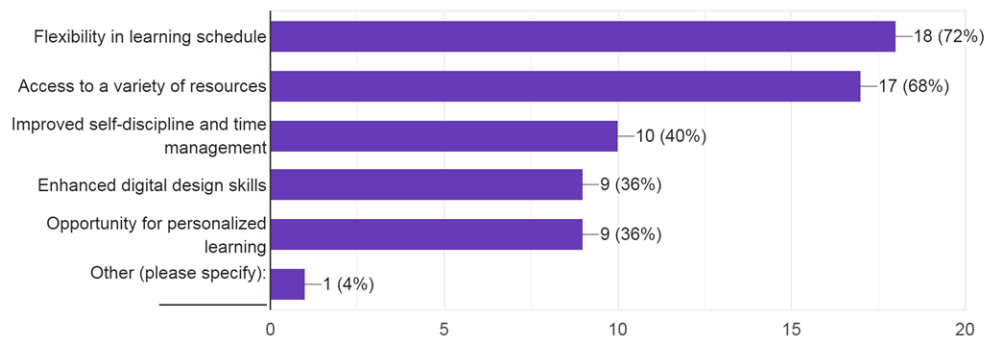

Figure 1: Advantages of online teaching in architectural education- students poll,
Source: Author

Only 10% of students agree with the fact that online teaching in helping to grasp complex architectural concepts.

48% are in strong agreement that online teaching cannot adequately replace traditional in-person teaching methods for architectural education. 32% students expressed opinion that partial online teaching benefits them in terms of flexibility and resources.

Almost all the students are in strong agreement that architecture is a course that should be practiced and experienced by hands on workshops, sire visits surveys and also interactions.

72% of the students are in strong agreement with conducting architectural education in blended learning mode (Fig 2: Survey by authors).
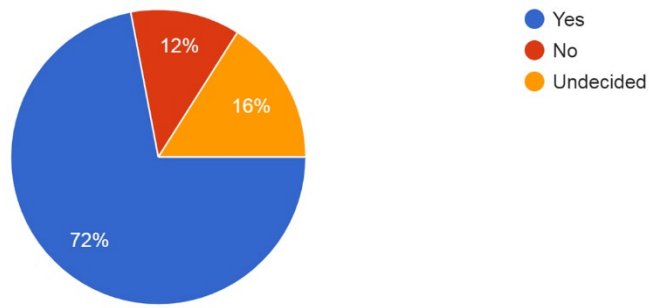
Figure 2: Students preference in adapting to blended learning mode
Source: Author

5.1. SUGGESTIONS AND RECOMMENDATIONS BY THE STUDENTS IN BLENDED LEARNING MODE

- Software coaching can be done online while practical classes can be done offline
- Organizing live virtual site visits for practical exposure, enhancing the online course environment
- Implementing a system for continuous feedback from students to identify areas for improvement and adapt teaching methods accordingly
- Online meetings can be conducted in person wise or maybe every person can get some extra time so they could clarify their doubts throughout the class.
- Collaborative projects
- Live demonstrations
- Mentorship programs
- Flexible scheduling
- Interactive design software
- Incorporating interactive 3D modelling software for virtual design exercises and fostering collaborative platforms for real-time critique and teamwork.

6. DISCUSSION

The inferences from the perspectives shared by the faculty and students conferred the value addition to the teaching and learning environment in terms of flexibility in the pace of learning and increased transparency in academic procedures. However, imparting architecture education completely through online teaching mode under unavoidable circumstances during Covid-lockdown resulted in the shortcomings like inadequate knowledge gain in the required drawing skills, incomplete learning confining only to the desktop studies where students could not conduct case-studies which provides first-hand experience in validating the knowledge gained., incomplete understanding on the behavior of building materials because of inability to conduct hands-on workshops and market surveys are to name a few which are vital. The effect of the above-mentioned shortcomings are evident in the majority of the students and teachers could witness during the testing an devaluation stage. Teaching was also a huge challenge during the lock-down because of various factors such as majority of the faculty were very new to online teaching mode which requires competency on ICT skills and student engagement.

The trend of online teaching was slowly shifted to blended leaning mode across all the programs in the institutes by considering the set of advantages and was being in practice consistently since post-Covid times. However, the extent of intervention in architectural education system is limited to certain parameters such as results regarding leaning outcomes and teaching challenges. The theory subjects could be dealt with blended learning mode, but sessional and

studio-based subjects required in-person interaction limiting the online intervention for sharing of resources. An inference on consensus was imparting and learning appropriate drawing skills and conduct is very effective through in-person interaction which assures a feasibility of instantaneous feedback resulting in on-the spot learning.

7. CONCLUSION

The transition to online teaching in architectural education elicited a variety of responses. Professors and students from various universities have highlighted the flexibility and accessibility of digital platforms as significant advantages. However, concerns about the hands-on, collaborative nature of architectural education persist. Feedback indicates that, while theoretical knowledge can be effectively imparted through online mediums, the practical application and tactile experience required for architectural learning are diminished. According to the survey, a hybrid model that combines the best of both worlds may provide a more balanced approach. Finally, the efficacy of online teaching in architectural education is dependent on the judicial integration of technology with traditional pedagogical methods, ensuring that the discipline's core experiential learning aspect is not jeopardized.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

Coursera. (2021). 2021 Impact Report - Serving the World Through Learning.

Dutton, T. A. (1987). Design and studio pedagogy. *Journal of Architectural Education*, *41*(1), 16–25. https://doi.org/10.1080/10464883.1987.10758461

Milovanović, A., Kostić, M., Zorić, A., Dordević, A., Pešić, M., Bugarski, J., Todorović, D., Sokolović, N., & Josifovski, A. (2020). Transferring COVID-19 challenges into learning potentials: Online workshops in architectural education. *Sustainability (Switzerland)*, *12*(17), 1–21. https://doi.org/10.3390/su12177024

Peck, D. (2024, January 11). Online Learning Statistics: The Ultimate List in 2024. Retrieved from www.devlinpeck.com: https://www.devlinpeck.com/content/online-learning-statistics

R Khan, A., & Thilagam, N. L. (2023). Architecture Studio Pedagogy: Review of Instructional Approaches. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4494911

Varma, A., & Jafri, M. S. (2021). COVID-19 responsive teaching of undergraduate architecture programs in India: learnings for post-pandemic education. *Archnet-IJAR*, *15*(1), 189–202. https://doi.org/10.1108/ARCH-10-2020-0234

Yu, R., Ostwald, M. J., Gu, N., Skates, H., & Feast, S. (2022). Evaluating the effectiveness of online teaching in architecture courses. *Architectural Science Review*, *65*(2), 89–100. https://doi.org/10.1080/00038628.2021.1921689

World Economic Forum. (2022, January 27). These 3 charts show the global growth in online learning. Retrieved from www.weforum.org: https://www.weforum.org/agenda/2022/01/online-learning-courses-reskill-skills-gap/