

Pedagogy for 'Architectural Graphics and Drawing' From Students' Perspective - Conventional Vs Virtual

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Abstract— 'Architecture' is the mother of all arts and a balanced combination of Art and Technology. Hence unlike Engineering, Architecture is one of the most rigorous, complex and detailed academic disciplines, which had a conventional classroom pedagogy prior to the pandemic.

Covid 19 pandemic has hit the world adversely but academicians have taken the challenges positively and various systems emerged out of technology to confine the students on work stations at home and continue education without a gap or failure. Online teaching with the help of gadgets have proved to be a boon in disguise essentially for theory subjects, but the students and faculty both faced severe challenges for studio subjects in Architecture.

Architectural Graphics and Drawing (AGD) is the subject pertaining to language of drawings. So, for a subject like AGD, especially for first year students of Architecture bachelors, it was experienced that the virtual teaching is not as effective as the traditional classroom teaching. Understanding of the basic sheet drafting is very important for the first-year students as it's the beginning of the study and architecture formative years. This paper aims at proving the hypothesis that the traditional classroom teaching is better than the remote learning, especially with the drafting subjects like AGD.

Keywords — Architecture; pedagogy in architecture; architectural graphics and drawing; virtual learning.

I. INTRODUCTION

Since ages, education has been the essence of society which uplifts, liberates and builds the character of the society (Role of Pedagogy in Architecture). Formal education needs essential planning, curriculum & pedagogy designing and careful enforcement of the same for the learners to get benefitted. Pedagogy means the method and practice of teaching, especially for an academic subject (Dictionary). Education is a negotiation between the student and the teacher establishing the relation between the content covered and the Institution's mission and vision (Smith). For any teacher, TEACH is LEARN. Prepare, teach, discuss and evaluate are the stages in any teaching learning process. All the four stages differ in percentages in different fields of Education. Ideal teaching and learning process in architecture prepares a student for critical and lateral thinking and put the theoretical ideas or dreams into reality.

Architectural Graphics must be demonstrated by teachers, while teaching on board, on computers, on black board to

display their own skills of sketching & drafting (Not announcing submissions & waiting in their cabins). In first year teaching doers are more important than talkers

— Dr. Harimohan Pillai



Fig. 1. To teach is to learn

Architecture is the mother of all arts and a balanced combination of Art and Technology. Hence unlike other few technical courses, Architecture is one of the most creative, rigorous, complex and detailed academic disciplines which had a conventional classroom pedagogy prior to the recent pandemic. The COVID 19 pandemic times tested the teachers and the students equally while continuing education without disruption, which otherwise would have been a huge loss of students and violation of right to education. Neither the teachers nor the students were trained or prepared for remote teaching-learning process. The series of lockdowns had bound the students and teachers at their respective homes spread across the country. Gradually both got accustomed to and accepted the situation to move on for the betterment of Education.

Virtual mode worked quite well for theory subjects in Architecture where the one-way information or knowledge could be imparted easily by the virtue of technology. But the students and teachers both faced severe challenges for studio subjects where observation, interaction, discussions face-to-face and demonstration was restricted. In Architectural Graphics and Drawing, a subject of language for Architects, especially in first year Bachelors, students begin to learn the basics like handling drafting equipment, sheet alignment to the board for drafting, appropriate selection of medium for drawing and sketching, even sharpening the pencil and maintaining the tip throughout drafting is taught in the

conventional offline studio. Faculty keeps a minute check on correctness and quality of the content during the studio hours. In the class, physically looking at the faces of the student/learner, a good teacher understands whether the information passed on is received well and absorbed or not. Students too need friends or peers for enthusiastic learning and enjoy teamwork than remote learning.

Faculty faced real time issues of continuous work during lockdowns to resolve the matters of students without even a break for food many a times. Personal attention was needed for better engagement of student on task or assignment online. Many students and teachers also faced psychological problems during crisis of lockdowns like there is stress, fear, anxiety, depression, insomnia that led to lack of focus and concentration (Dhavan, 2020)

Hence an effort is taken through research to find and prove the hypothesis, based on responses from the students pertaining to the subject of language – Architectural Graphics & Drawing.

II. LITERATURE REVIEW

The shift from old conventional black board teaching methods to a new contemporary became a must during lockdown. The pandemic pushed the teachers to find innovative and interesting ways to communicate and educate the learners. But there are likely merits and demerits of online method which could be listed as follows.

- Facilitates the instructor or learner to teach or learn at any place and time.
- Facilitators, mentors from various parts of the world could join for teaching sessions.
- Affects concentration, focus and effective learning due to the background noises and distractions.
- Sharing of online information is easy during the lecture even.
- Learning on small screens of the gadgets does not form mental impressions to memorise and hence is soon faded away.
- Costly gadgets are needed to be bought inevitably.
- Formal technical training is required initially for operating the apps, classrooms, etc. for the faculty or mentors.
- Attention span is lesser than actual face to face learning for students.
- Faculty is not aware of the presence of student online even though the login is seen.
- Attentiveness could not be checked during online lectures while sharing the screen.
- Connectivity issues of network poses threat to continuity and audibility of lectures online.
- Listener or student loses interest in the subject if the gadget doesn't work well due to poor connectivity.

III. VARIOUS METHODS AND TEACHING PRACTICES

Since decades of architectural education, the pioneers in this profession have set some standard pedagogy for various subjects which further evolved and got improved with changes in syllabi over the period of time in the benefit of students.

A. Blackboard / whiteboard teaching with good sketches

The oldest method is the blackboard teaching in which the freehand sketching skills of the teacher are essentially needed. The figures drawn on the board might not be drawn to scale but should convey proper proportions and correct essence to the students otherwise this method would not prove to fetch good results as far as understanding & grasp of the subjects is concerned. Fig. 2 shows sketches drawn by faculty while explaining the given problem on the blackboard

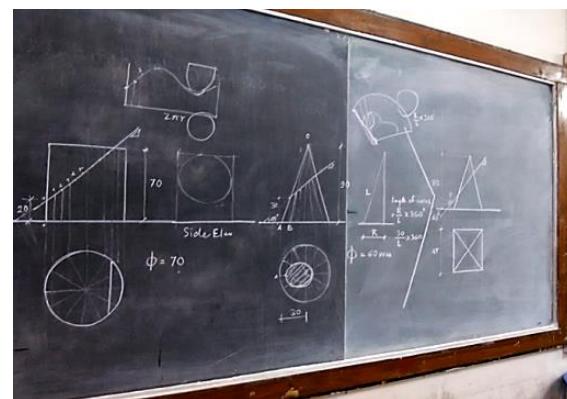


Fig. 2. Blackboard sketching

B. Use of models for explanation and better visualization

Models made by students in workshop subject could be used for perception & visualization as well as faculty also can make use of some readymade models, as shown in Fig.3. if available in the market or make an exclusive object for students to visualize and understand better.



Fig. 3 Use of models in explanation of object drafting

C. Demonstration and explanation on Drawing board

All the students are not of same aptitude and intellectual capacity. Some students need a demonstration, as shown in Fig.4. To explain the given assignment on the drawing board of the student which not only develops an understanding but also builds confidence that if the teacher can solve it, they can also perform following the ideals of the mentor. Hence the teacher should be trained enough and experienced to teach and become student's idol.



Fig. 4 Use of models in explanation of object drafting

D. Presentation and lecture

Even for practical & studio subjects, a method adopted by teachers is sometimes a lecture with some visuals through power point presentation whether offline in the audio-visual room or through online virtual mode, as shown in Fig.5.

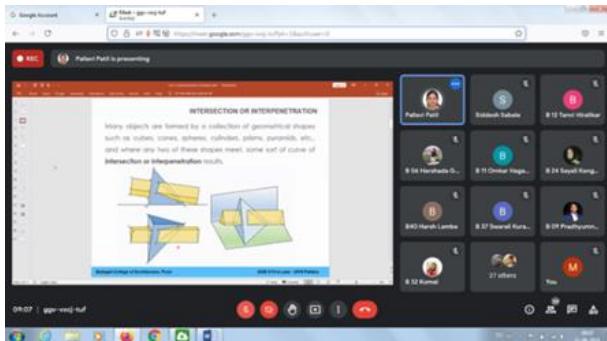


Fig.5 PPT being presented to students in the class

E. YouTube videos presented during the class online or offline

The videos on various subjects and various topics of curriculum are available online, which apart from mundane daily lectures could be presented to the students for creating interest. The content being the same, difference in classroom teaching and the instructor teaching in the YouTube video is that the presentation in you tube is in story telling format or sometimes like a short film with technical information included in it.



Fig. 6 Youtube videos being presented to students in the class

F. Softwares for Drawing & Drafting

During pandemic, teachers experimented with lot of methods which were not used much, but due to constraints, these methods were found useful by young techno-savvy teachers. CAD software, sketching software were some pedagogies used during online education.

HYPOTHESIS – Traditional pedagogy is better than virtual contemporary for the subject - Architectural Graphics & drawing in first year B.Arch. course.

AIM: To understand the lacunas /deficits of online learning from students' perspective for AGD subject.

OBJECTIVES:

1. To compare virtual vs traditional pedagogy and search for the best pedagogy for AGD subject from students' perspective.
2. The findings could improve the pedagogy of other studio subjects in Architecture course.

SCOPE & LIMITATIONS

1. The scope of the research is restricted to First year AGD only
2. The survey is conducted with students as samples and are limited to one institute with 4 divisions with different teaching faculties.

SAMPLING CRITERIA- For understanding whether online (virtual) or offline (Traditional/conventional) mode was better, it was essential to conduct survey with students who had attended classes online and offline as well. Hence selected 72 current third year students who attended first year first semester in college before lockdown and later shifted to online mode due to pandemic.

For understanding shortcomings or issues faced in online mode, it was necessary to survey students who attended AGD only on online mode. For this survey the current second year students were selected.

METHODOLOGY: A literature survey through research articles was conducted, to understand what difference was experienced by students regarding teaching- learning during the pre-pandemic offline & during lockdown online education.

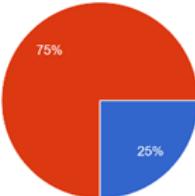
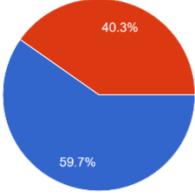
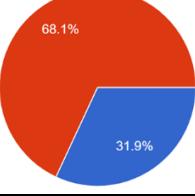
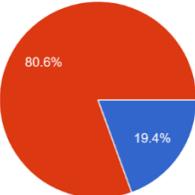
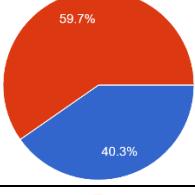
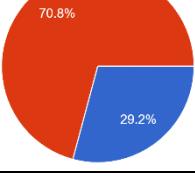
Preliminary survey - It is said that the students of today are of google age and more tech-savvy, hence it was anticipated that the students would respond in favor of online pedagogy when the choice was asked between online and traditional. And surprisingly all 72 students expressed that offline teaching is better in 6 criteria out of 7 answered, through google forms.

Analysis of preliminary Survey

Google form 1 – Select the better or preferred option

- Online
- Offline

TABLE I. FOR SELECTION OF PREFERRED OPTION BY STUDENTS FOR GRAPHICS SUBJECT

Sl. No.	Option description	Distribution based on survey graphics	Distribution %	Result
1.	Knowledge gain (grasp of the subject)		Offline = 75% Online = 25%	Offline traditional teaching of AGD is better for knowledge gain
2.	Time bound work		Offline = 40.3% Online = 59.7%	Online teaching of AGD is better for time bound work
3.	Focus & Concentration		Offline = 68.1% Online = 38.9%	Offline traditional teaching of AGD is better for focus & concentration
4.	Clearing of doubts (Problem solving)		Offline = 80.6% Online = 19.4%	Offline traditional teaching of AGD is better for clearing of doubts
5.	Self-motivation		Offline = 59.7% Online = 40.3%	Offline traditional teaching of AGD is better for the students to be self-motivated
6.	Team work		Offline = 70.8% Online = 29.2%	Offline traditional teaching of AGD is better for the teamwork

RESULT OF PRELIMINARY SURVEY FOR BACKGROUND STUDY -

From the above pie-diagrams, it can be concluded that in student's perspective five points out of six results into the preference of Offline traditional & conventional pedagogy for first year Architectural Graphics & drawing.

SURVEY FOR PRIMARY DATA -

After the preliminary survey another set of google forms were devised, one for surveying current second year students to understand the deficit & difficulties in the online mode of education as well as second one to compare and express the

merits of conventional & traditional teaching for current third year since they had experienced first year with traditional class room teaching and online mode in second year. These forms were mailed to the samples who were good in AGD subject hence would give correct opinions as responses to survey questions. This criterion led to the sample size of 20 students from current third year and 20 students from current second year.

After making fresh google form as a tool for online survey a pilot survey was conducted to test the tool through 4 students responding the form. Since the students successfully responded the google form wisely without much difficulty, the

forms were mailed to the short-listed students and the responses were soon received.

ANALYSIS

According to the received primary data from third year B.Arch. students following are the bar charts representing the percentages of responses as 4-point scale as –

- Completely disagree - Blue
- Somewhat Agree - yellow
- Agree - orange
- Completely agree - Green

1. Teaching Methods preferred by Current third year students for First year AGD

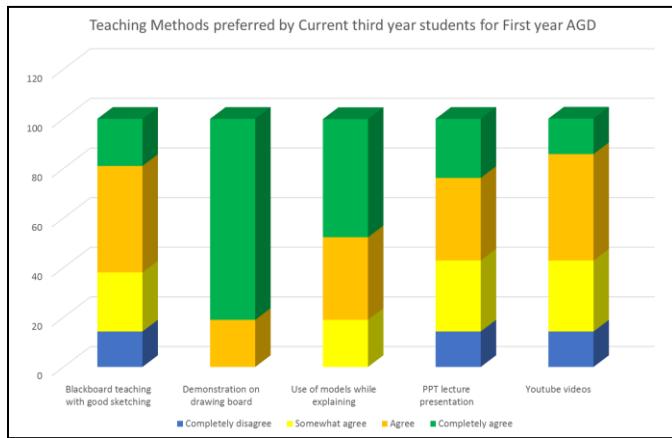


Fig. 7 Bar chart showing students responses to the teaching methods preference

Interpretation –

- 85 % of students agreed that teaching with good & understandable sketches on black board by teacher helps for better understanding
- All 100% students agree that demonstration helps for understanding. This undoubtedly proves that demonstration on drawing board is very important for drafting subjects
- 81% agreed that 3D models help for better visualization
- 57% agreed but 43% students may not understand graphics via only lecture and power point presentation.
- 85 % agree that a proper explained YouTube video, shared by faculty, helps in self-learning.

2. Reasons why working offline is better – by current third year students

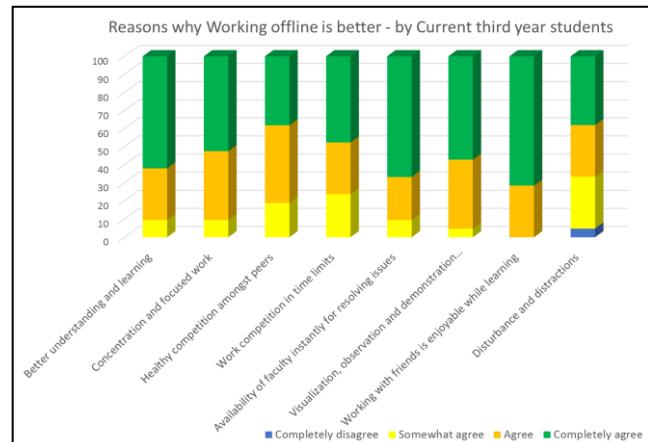


Fig. 8 Bar chart showing students responses to the reasons why traditional teaching method was preferred

Interpretation -

- 61.9 % strongly agree & 28.6 % agree that offline studio is effective in better understanding and learning.
- All 100% agree that concentration is better in offline studio
- 81% agree that offline studio provides healthy competition amongst the peers and 19% somewhat agree to it.
- 47.6% strongly agree & 24% agree that work time deadlines are followed strictly in offline mode.
- 67% strongly agree the need of faculty in the studio for solving doubts in drafting subjects like AGD.
- 57.1% strongly agree and 38.1% agree that Visualization is better developed in offline classes.
- 100% agree that social interaction amongst students themselves is a must for the happy learning experience.
- 95% agree that the distractions at home affect the work quality as well as quantity.

3. Teaching Methods preferred by Current second year students for First year AGD

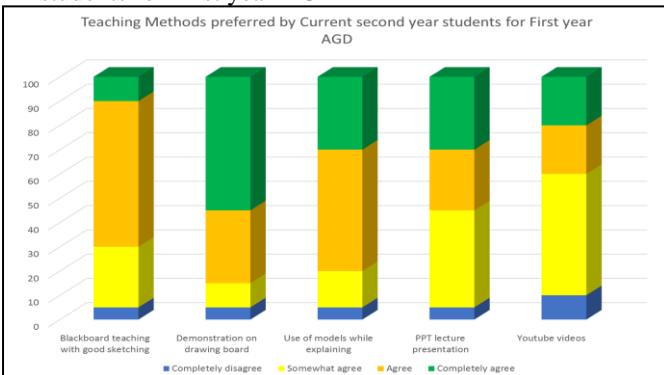


Fig. 8 Bar chart showing students responses to the teaching methods preference

Interpretation –

- 70 % students agreed, 25% somewhat agreed & 5% disagreed that teaching with blackboard sketching helped in better understanding
- 55% students strongly agreed and 30% agreed and recommended learning by demonstration on drawing board.

- 80% expressed that 3D models while teaching do help for better visualization
- 55% agree but few students may not understand graphics via lecture and presentation. The responses though are nearly 50-50% but out of observation and experience of the faculty, merely lecture doesn't give an impactful learning for students as they hear and see the visuals but do not register.
- 20% completely agree, 20% agree, 50% somewhat agree & 10% completely disagree that a proper explained YouTube video shared by faculty, helps in self-learning. This means first year students should not be left to the mercy of self-learning, rather they should be taught by all means & ways till they completely understand at least the basics.

4. Lacuna in online learning by Current second year students for first year AGD

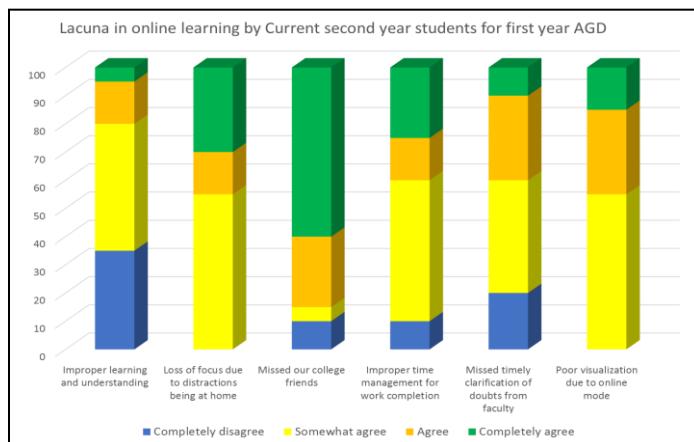


Fig. 9 Bar chart showing students responses to the shortcomings faced by students in online teaching learning process

Interpretation –

- The mode of teaching learning (online or offline) didn't affect 35 % students, whereas 65 % faced issues with online learning for studio subjects like AGD.
- 30% completely agreed, 15% agreed & 55% somewhat agreed to loss of focus and concentration due to distractions being at home in virtual learning.
- 60% completely agree, 25% agree that interaction with the peer is a must as a basic human behavior & hence missed their friends & college during online learning.
- 40% of students agreed & 50% somewhat believed that time management was difficult in online mode.
- 40 % students agreed, 40% somewhat agreed & 20% completely disagreed that timely solution to their doubts from faculty would have helped for their learning process.
- Visualization as a basic need for an architect, 15% students completely agreed, 30% agreed & 55% somewhat agreed that they missed the opportunity for skill development in online mode.

The samples were also given the choice in the Google form at the end of questions as 'Any other' so as to discuss or put forth an opinion or an issue. So some students mentioned –

- communication issue between the class and teachers

- network issues
- due to online class students could not understand the concepts effectively
- due to online mode practical knowledge and actual drafting on sheet was missed
- drafting with guidance of teachers was missed

CONCLUSION

- Teaching with good & understandable proportionate sketches on black board by teacher helps students for better understanding. This would essentially require the teacher to be skilled enough for sketching with chalk, marker pens etc. on boards or the teacher should be experienced who have developed skills over the years.
- Demonstration on drawing board is very important for drafting subjects like AGD for first year students.
- First year students should not be left to the mercy of self-learning, rather they should be taught by all means & ways whether online or offline, till they completely understand at least the basics of AGD.
- Offline education in the studio creates a healthy environment & happy teamwork for the students. Exclusive studios are more focused & student is able to concentrate better

Hence it is proved that Traditional pedagogy is better than virtual contemporary for the subject - Architectural Graphics & drawing in first year B.Arch. course. But in case virtual education becomes inevitable for some reason, the conventional pedagogy could be followed by teachers and relayed through various methods to reach to distant students. The probable solution to this problem could be Installing cameras in the class rooms equipped with blackboard could be a solution in case of partial lock down when teacher is able to use the institute class room.

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