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Challenges Faced by Students in Online Architectural Design Studio During COVID-19 Pandemic: Universities in Sarawak



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Abstract This paper attempts to identify the challenges faced by architecture students, learning in an online studio environment during the COVID-19 pandemic. In complying with COVID-19 Standards of Operations (SOPs), schools and universities in Sarawak, Malaysia, were closed and classes were forced to be conducted online. Despite prior integration of ICT-based learning into the architecture curriculum, the Architectural Design Studio subject still utilizes the conventional method for teaching and learning. Normally, Architectural Design Studio is conducted in a physical environment where lecturers would demonstrate critical hands-on skills such as drawing and model-making techniques, and conducting critique sessions and site analysis, all of which require students to participate in-person. Unfortunately, all of these activities were forced to be adapted to facilitate online-and-distanced learning due to the pandemic. As a result, students encountered several problems during the switch to the virtual design studio. The purpose of this study is to recognize the setbacks experienced by students in order to generate solutions that may improve the quality of online Architectural Design Studio. The research employs a quantitative descriptive study conducted using a survey method. The data was collected from undergraduate students from two architectural schools in Sarawak, namely the University of Malaysia, Sarawak (UNIMAS) and the University College of Technology Sarawak (UCTS) via a Google Forms questionnaire distributed to the students through WhatsApp groups. The analysis of students' responses confirms that Architectural Design Studio carried out in the conventional method is more effective than when conducted online. The results indicate that the major disadvantages of the online studio were the lack of infrastructure, poor Internet connection, limitations in project materials and data collection for site analysis, imbalance in levels of digital competency, and inefficacy of doing studio work at home. This paper will identify the current online teaching method's flaws that impede our progress toward a more resilient future in architecture.

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1 Introduction

According to the Board of Architects Malaysia, the accreditation manual for architectural programs contains five (5) major subject clusters (see Fig. 1). Architectural Design Studio has the most credit hours per week among the subjects offered in the architecture curriculum, typically a minimum of six credit hours per week [1]. Besides Design Studio, there are also many other subjects offered in the program such as Building Technology, Graphic Communications, History of Architecture, and more. However, these subjects play a more supporting role and are required to be integrated with Design Studio in every semester (see Fig. 2). As a core subject, Architectural Design Studio aims to cultivate the imagination and design thinking of students with the purpose of enabling them to create architectural designs that utilize both critical and poetic thinking. In this course, students are trained with the skills to work intuitively and pragmatically and are required to express their ideas and creativity through various communication techniques such as drawings, physical models, computer-generated models, digital visualizations, photography, videos, and verbal presentations [1]. However, effective on the March 18, 2020, the Prime Minister of Malaysia, Tan Sri Dato' Haji Mahiaddin bin Md. Yasin, has decided to implement Movement Control Order (MCO) throughout the nation. The Ministry of Education and the Department of Health has ordered the suspension of all academic activities to prevent the spread of the virus. For uninterrupted learning, the Ministry of Higher Education (MOHE) recommended that universities of higher education conduct classes online. Hence, the COVID-19 pandemic and the resulting need to socially and physically distance has posed an exceptional challenge for students to experience Architectural Design Studio classes, as most of the activities are interactive and needed in-person participation. The shift to online-and-distanced learning brought along its own set of challenges, as the majority of the students enrolled in the architecture programs in both UNIMAS and UCTS are from Sarawak, with some living in the outskirts of the state. This has made virtual classes even more difficult due to limited Internet access in such areas. Obtaining the necessary materials for model making and drawings also became a challenge for the students as most stores were closed and traveling across district borders was prohibited during the lockdown.

2 Literature Review

Several studies reaffirm that Architectural Design Studio is a dominant course in the architecture syllabus that requires a hands-on, social, and physical approach in its pedagogy. According to Donald A. Schön [2] in his book *Educating the Reflective*

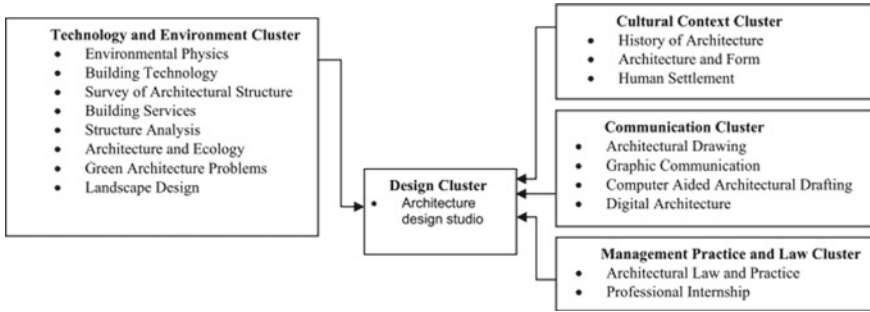


Fig. 1 Showing 5 main clusters with the subjects offered in each cluster

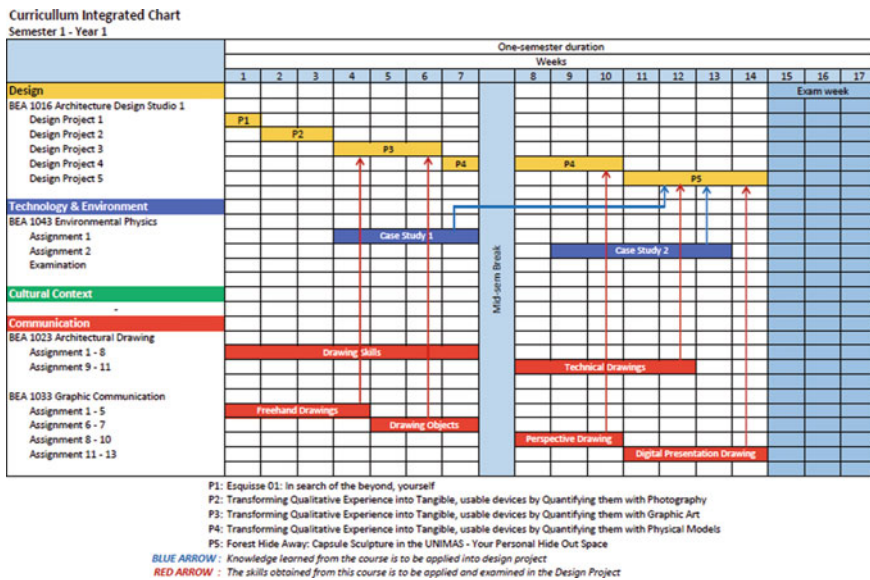


Fig. 2 Example of 1st year curriculum integrated chart

Practitioner, the concept of the design studio is inherently founded upon the process of ‘learning by doing’ and ‘reflection in action’. The design studio encourages reciprocal dialog that goes beyond the relationship between educators and students; it also forms a culture of collaborative learning among the students themselves [2]. This aspect of the design studio is an integral part of the architectural training, yet it is an informal element that was born out of the socio-spatial relationships subject to the availability of physical space [3]. Similarly, Nair and Raja [4] have stated that the Architectural Design Studio is a subject that requires physical space and engagement as it is a critical factor for learning to occur through drawing, discussions and seeing. Hence, when the COVID-19 pandemic brought with it the closure of educational institutions

and the switch to virtual classrooms, educational sectors across the globe had been affected [5]. While most researchers agree that the impact of online-and-distanced learning has a negative impact on students, there is also a minority that had reported positive changes. Majority of the literature which stated the disadvantages of the online architectural studio has come to a similar conclusion, in that the efficacy of the virtual studio is much less compared to the conventional design studio. Varma and Jafri [6] attributed this to the challenges reportedly faced by the students, such as the divide in digital competency, lack of infrastructure and access to a stable Internet connection, lack of technological hardware, and lack of focus during virtual tutorials. Additionally, technical problems, the lack of necessary devices [7], and also materials to carry out projects [8] made it difficult for students to learn in a virtual and remote studio environment during the pandemic. Although the aforementioned literature has done many studies on students' perception of online Architectural Design Studio, it has not specifically covered the demographic group of students living in rural areas who may have experienced additional levels of hardship during this pandemic. Conversely, research that did cover a similar demographic to this paper was not specifically targeted at the architectural discipline but did report a small percentage of respondents that preferred conventional face-to-face learning due to the course being governed by professional bodies [9]. While most literature pointed to the negative effects of implementing architectural design studios online, this paper also took into consideration the studies which reported a successful experience in shifting to virtual design studios during the pandemic. It can be deduced that there are two factors that contribute to the positive results discovered by these studies. The first factor can be attributed to a limitation in the survey demographic, where the study was carried out only on participants from a country that was more developed than the sources in the other papers. Thus, the transition to an online studio utilizing various digital media and tools [10] was not hindered by factors of infrastructure and variations in digital competency. The second factor finds that students in higher levels of their undergraduate course and the master's students experienced a more [3]. In light of these factors, the purpose of this research aims to identify the challenges faced by students enrolled in online design studio courses offered by universities located in Sarawak, where the student population is more inclusive of those living in rural areas. This paper aims to bridge the gaps in this particular corner of research, and to generate solutions that will be more accessible and beneficial for all architecture students regardless of their geographical or socioeconomic limitations.

3 Research Method

The research in this paper was conducted by using a survey method. The respondents of the survey were undergraduate students enrolled in architecture programs from the University of Malaysia, Sarawak (UNIMAS) and the University College of Technology Sarawak (UCTS). The data collection was carried out by asking several questions that requested students' honest evaluation of their experience in virtual

Architectural Design Studio classes, in the form of a questionnaire created using Google Forms. The questionnaire was then distributed to the students' WhatsApp groups and received responses from a total of 117 students.

4 Results and Discussions

4.1 *Distance Between Students' House and the City Area*

The chart in Fig. 3a shows the number of students who participated in the survey and the distance between their houses from the city. The data shows that a total of 62 students stay at least 20 km away from the city, with a total of 19 residing over 50 km, and only 55 students are located within the city area. The purpose of this information is to help identify the number of students that may face difficulties during the Movement Control Order (MCO) due to their location during the lockdowns. Very often, students would buy stationery and materials for the production of drawings and 3D models in order to fulfill project requirements given in the design studio. As most stationery stores are concentrated in the city areas, it can be anticipated that some students may have difficulties in obtaining materials for their projects. Figure 3b proves the point as 43% of students have had issues in sourcing materials during the lockdowns. By understanding the students' location during virtual classes, lecturers can better prepare project briefs that would not put too much of a requirement for students to purchase new materials. For example, drawing submissions can be in A3 paper sizes instead of the usual A1 and students would be allowed, if not encouraged, to use recycled materials sourced from around the house for their 3D models.

4.2 *Infrastructure*

The data in Fig. 4 shows that 34 students have less than satisfactory Internet connection at home. Universities in Sarawak have a higher concentration of students originating from the state itself compared to institutions in other states. UNIMAS, as an example, mainly takes in students from Sarawak with a focus on students from lower income families [9]. Together with the data from Fig. 3a, it can be understood that the student's distance from the city or their location in the outskirts can be linked to the quality of infrastructure available to them. This is in line with a report by the Malaysian Communications and Multimedia Commission (2019), which stated that Sarawak only has a 5.3 fixed broadband penetration rate per 100 inhabitants, which is less than the national average of 8.1. Compared to other states in the nation, like Kuala Lumpur and Selangor with 13.9 and 14.6, respectively, Sarawak despite being the largest state in the country, has most of its rural areas unequipped with the infrastructure needed to support better Internet accessibility. This has then become one of

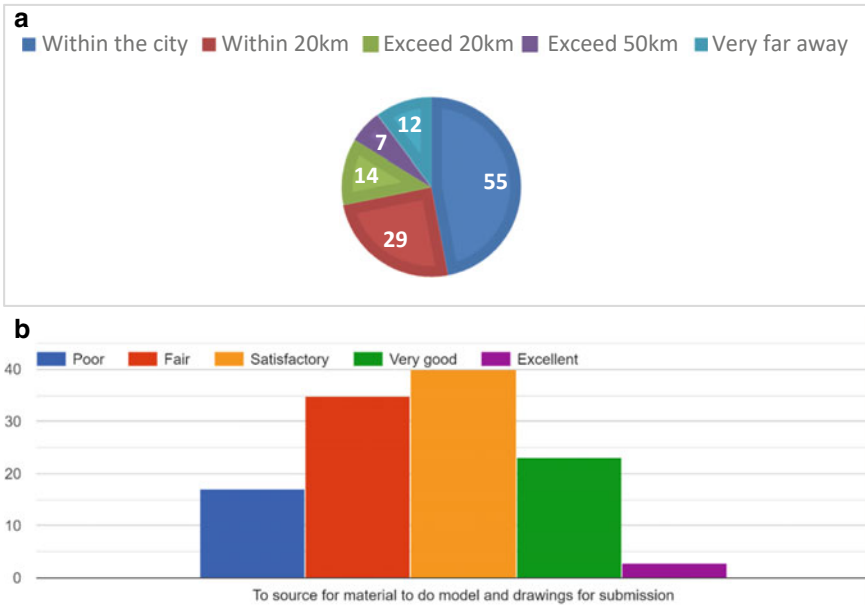


Fig. 3 a The number of students and the living distance from the city, b ease of obtaining materials for model making and drawings to fulfill submission requirements

the main obstacles for online learning, as students may disconnect during virtual tutorial sessions or be unable to upload submissions on time. Communication between lecturers and students also became an issue when online platforms, being the main method of communication during the pandemic, is rather unreliable for students with poor Internet connection. Lecturers would then need to contact the students privately for design crit and tutorial sessions to minimize the usage of Internet data while some students may need to substitute live presentations with pre-recorded videos.



Fig. 4 Students' evaluation of their Internet connection availability

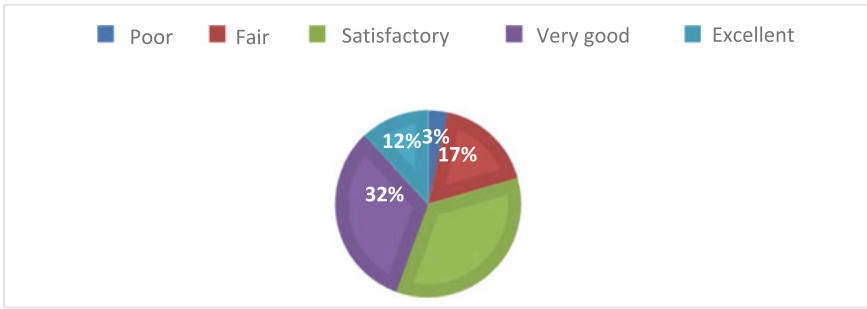


Fig. 5 Students' evaluation of digital competency in access to technological gadgets

4.3 Digital Competency

There is an obvious imbalance in the level of digital competency among the students. As the students come from various socioeconomic backgrounds, some of them may face setbacks caused by the lack of technological devices needed for an online design studio. While some may have to share a single laptop with multiple family members, most of the students faced problems with the devices lagging, since most are using devices with basic performance specifications that are insufficient to support the drafting or rendering software used in studio projects. Students with such limitations in technology had difficulty in keeping up with their peers and were often unable to complete their work on time. The chart in Fig. 5 shows that 55% of students were not very confident in their level of digital competency during online learning. As such, lecturers can allow students to submit manual drawings for the project submissions, which may help to provide a fairer playing field for all students.

4.4 Efficiency in Doing Studio Projects in the Home Environment

Figure 6 shows the students' perception on the efficiency of doing projects at home. From the survey results, 50% of the students felt that it was inefficient to do studio work at home during online learning. Unlike the conventional studio environment, a virtual design studio would require students to be extra disciplined and to work independently on their projects. Remote learning during the pandemic means that students would lack in peer learning along with its benefits of peer pressure and motivation, which is often more present in a physical studio environment. Subsequently, plenty of distractions abound at home and not everyone enjoys the luxury of having a designated space in the house for a personal workstation. Limitations in space and having to take turns using the dining table for work may also result in an environment that is not very conducive. Additionally, interruptions to the student's work schedules



Fig. 6 Efficiency in doing studio work at home

may also come in the form of emotional and family pressures, and trying to multitask house chores during class hours. Taking all these into consideration, students may lose enthusiasm to produce good work and find it hard to focus and manage their time.

4.5 Remote Site Analysis and the Difficulties in Collecting Data

Based on the data in Fig. 7, it was found that an average of 40% of the students had difficulties in conducting site analysis remotely. The majority of the students agreed that it was rather difficult to understand the site context as they were only able to experience the site through Google Maps and Google Earth, along with other online research which provided limited data. The ability to conduct site analysis is crucial for architecture students as architects are trained to design in accordance with the site context. With incomplete data of the building site, misinterpretation of the site and its surroundings may lead to further problems during later design and development stages of the projects.

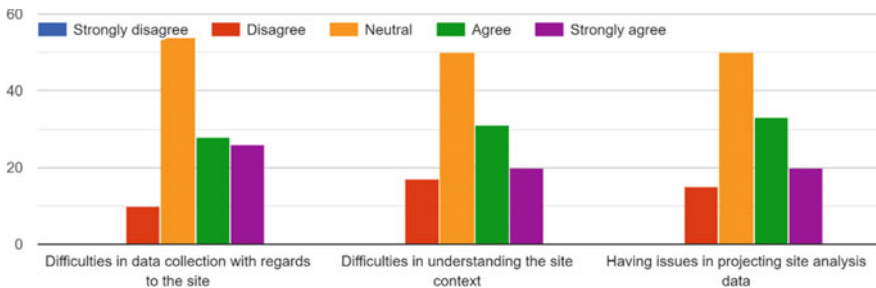


Fig. 7 Students' evaluation on the levels of difficulty in conducting site analysis without a site visit

117 responses

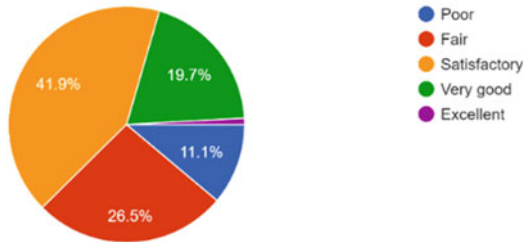
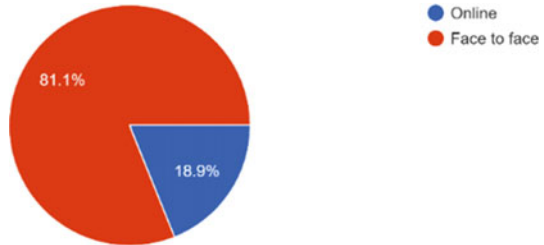


Fig. 8 Student’s perception on the effectiveness of online teaching

Fig. 9 Students’ preference for the architecture design studio



4.6 Students’ Perception of the Effectiveness of Online Teaching

Results of the survey (Fig. 8) show that 37.6% of students find it less than satisfactory for an architectural design studio to be conducted online. Most of the descriptive feedback reported problems with the Internet or devices lagging, lack of interaction whether it was between lecturers and students or among their peers during long tutorials, miscommunication, stress, and burnout from excessive hours spent in front of the screen and lack of motivation for work. A total of 81.1% of the students preferred a conventional in-person design studio compared to the virtual alternative (Fig. 9).

4.7 Discussion and Conclusion

The COVID-19 pandemic has impacted educational sectors all over the globe and across various disciplines, and architecture is not an exception. What was once such a signature and an essential part of the architectural pedagogy, the conventional Architectural Design Studio was halted and had to be repackaged and adapted for virtual and remote learning. As efforts are poured into ensuring that education still continues online, it is very important to assess the efficacy of such changes and

understand the process from the student's perspective. Based on the research in this paper, it can be concluded that:

1. Students found online teaching to be ineffective as miscommunication, aside from previously stated problems, would often occur. The majority of them would prefer the conventional method over the virtual design studio.
2. The survey results show that 34% of the students experienced unstable Internet connections during the online design studio classes, resulting in disruptions during the learning process. Issues with Internet access can be associated with the limitations in local infrastructure, especially in the outskirts and rural areas of Sarawak.
3. The geographical locations of the students during the lockdowns were a factor in their inability to access the Internet and get course materials. In the meantime, socioeconomic disparities among pupils have led to unfair assessment, as some students may lack the necessary gadgets and technical skills to keep up with the online curriculum.
4. Approximately, half of the respondents said that working on studio tasks at home was inefficient because students were easily distracted and lost motivation. Over long hours of staring at a screen, a lack of peer learning and social interaction with lecturers and classmates contributed to a loss of focus and burnout. Without in-person site visits, students were unable to fully understand the site context to conduct proper site analysis.
5. By understanding students' challenges with the online design studio, suggestions were made to improve the online syllabus. This involves modifying project briefs to allow flexible submissions, recording and sharing online sessions, and designating peer assistance groups.
6. While there are bigger issues behind some of the obstacles faced by students associated with infrastructure and socioeconomic development that could not be solved with the recommended solutions, this paper hopes to raise awareness of such prevalent issues that students in Sarawak are facing.

As the COVID-19 pandemic has rendered the future uncertain, the decision to shift Architectural Design Studio courses online is needed to ensure students receive continuous learning. However, universities in Sarawak have a unique student demographic that comes with its own set of challenges. Therefore, as literature about online design studio pedagogy proceeds to expand, it is imperative to review and understand the obstacles these students face and identify the factors so the quality of online architectural education can be advancing toward a more resilient future for architecture.

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