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“Rethinking Built Environment: Towards a Sustainable Future”

Organiser:
**Research, Industrial Linkages, Community
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Co-organiser:
**Department of Built Environment Studies & Technology (JABT),
Faculty of Architecture, Planning & Surveying (FSPU)**

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Blended Architectural Design Studio Learning for Resilient Architecture Education

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Abstract

The spread of the COVID-19 pandemic has changed the landscape of the nation's education system. Such closure accelerated the development of the online learning environments within those institutions so that learning would not be disrupted. The pandemic has tested the readiness of centres to deal with a crisis that requires online and remote measures. HEIs need to implement classes with various online methods to ensure learning continues. However, lack of face-to-face interactions between learners, learners and instructors, and the effectiveness of online learning is called into doubt. The architectural design studio also struggled to adjust to this event due to the socially involved aspects of design education and learning, which many design tutors say make it difficult, if not impossible, to teach design online. As a result, learning engagement and belonging in architectural design studios suffer from this strategy. This paper aims to review students' and educators' experience teaching and learning on the effects of online learning during this pandemic. Thus, literature has been reviewed on the impact of online learning during this pandemic, which caters to several aspects of students' and academicians' feedback and architectural design studio in digital platforms. This paper presented the concept of blended learning, which combines the benefits of synchronous critiques and asynchronous learning and allows for cross-time and cross-space engagement with institutions and experts. The findings suggested that students may have difficulties dealing with technology, particularly in terms of usage and acceptance by students. Students' acceptance and use are significant for the academicians to be well-designed and well-prepared the course plan, contents, and instructions within the digital platform. This study's findings will significantly contribute towards teaching and learning experience and as a guideline for educators and policymakers to implement the blended learning platform as an alternative to traditional learning approaches.

Keywords: *Architecture design studio; blended learning; technology acceptance; learning engagement; belonging*

1.0 Introduction

The world has been shocked by the global pandemic from Covid-19 in early 2020. Businesses, sports activities, services, and education needed to be closed. Higher Education Institutions (HEI) were also adversely affected by the new-onset Covid-19 pandemic (Chung, Mohamed Noor & Mathew, 2020). This event has forced HEIs to change their operations and academic delivery. It is not an easy task for drastic changes where before Covid-19 happens. Several parties within the education system must be concerned about the digital transformation of HEIs, and currently, people's abilities to apply new technology in all facets of life are incremental. Thus, universities must prepare potential professionals for the future (Bond, Marin, Dolch, Bedenlier, & Zawacki-Richter, 2018; Sandkuhl & Lehmann, 2017) and respond to the changes imposed due to novel technologies (Abad-Segura, González-Zamar, Infante-Moro & Ruipérez García, 2020).

Starting in December 2020, all public and private universities in Malaysia will undertake teaching and learning activities through online learning, according to the Ministry of Higher Education (Malaysian Ministry of Higher Education, 2020). Joshi et al. (2020) stated that online learning's

instructional effectiveness is questionable due to the absence of face-to-face interactions between learners and learners-instructors. Using a combination of Hodges et al. (2020) and some theory, an analysis revealed that well-planned online learning experiences differed from crisis-response courses. As such, this study notes that online education during this outbreak was referred to as "emergency remote teaching," whereas effective and high-quality learning was known as "remotely effective teaching."

Hence, this online learning made architectural design studio learning questionable. It is unprecedented to conduct the studio within a fully online learning environment in Malaysia. Generally, learning architectural design is studio-based learning. It is widely believed to be a central pedagogical value in design education (Fleischmann, 2020; Wragg, 2019), which has been pedagogically and theoretically justified by Schön's (1984) learning by doing, contextualised problem-solving (Buchanan, 1992), artefact creation (Simon, 1969), integration of workspace and social environment (Hart et al., 2011) and learning through experience (Seitamaa-Hakkarainen et al., 2016). Developing an architectural identity, the capacity to observe and form peer connections and the ability to problem-solve are all critical components of architectural education (McLaughlan & Chatterjee, 2020). Thus, are HEIs that offer architecture programmes struggling with the current pandemic? Since the architectural design studio learning demands a social constructivism learning approach as explained above, the online learning environment could give the learners and instructors headaches to achieve optimum learning outcomes. It is because a design studio's learning process is divided into three distinct stages: self-directed study and discovery, tutor-student communication via critique sessions, and background informal peer learning among the students (Iranmanesh & Onur, 2021). The communication can render ineffective where both learners and instructors are newbies in this new learning environment. 'Studios' refers to a learning pedagogy for students motivated by a project-based problem, frequently developed from issues or problem-based conditions as a medium for design studies, where activities such as input lectures, definitive studies, talks, discussions, critique sessions between lecturers and students at their desks, presentations, and critiques for learning sharing purposes, portfolio, review, and exhibitions are conducted. In physical terms, studios can also be interpreted as a specialised studio space used to facilitate the activities above, including individual workspaces for students and academic staff. When necessary, a studio's operating hours might be extended to 24 hours a day (Council of Architectural Accreditation and Education Malaysia (MAPS), 2020).

Therefore, it is important to review several issues and problems in online and blended learning of architectural design studios from previous research studies and articles. Using and adopting technology in the architecture design studio drastically during this pandemic had questioned the acceptance from the students. Does the students' performance decreased? Is the essence of the studio learning missing during this pandemic? What is the future of architectural design studios after the pandemic? Thus, this paper aims to investigate these issues, problems, and consequently make suggestions on online and blended architectural design studios towards promoting a resilient architectural education.

2.0 Methodology

Research on online and blended learning, architectural design studio, and COVID-19's impact on higher education institutions was undertaken through a literature review. Journal articles, conference proceedings, and existing HEIs and professional board guidelines from top databases such as Scopus, Taylor & Francis, ScienceDirect, Google Scholar, and Academic Search Premier were the primary sources of information for the study. To ensure the most up-to-date inputs, these studies were mainly drawn from 2018 to 2021.

3.0 Findings and Discussions

Three(3) aspects are selected to be discussed based on the current scenario and existing literature review, issues, problems, and suggestions on online and blended architectural design studios towards resilient architectural education, which are student's an academician's feedbacks on online learning,

blended learning for architectural design studio and technology acceptance and use for architectural design studio learning engagement and belonging.

3.1 Student’s and Academician’s Feedbacks on Online Learning

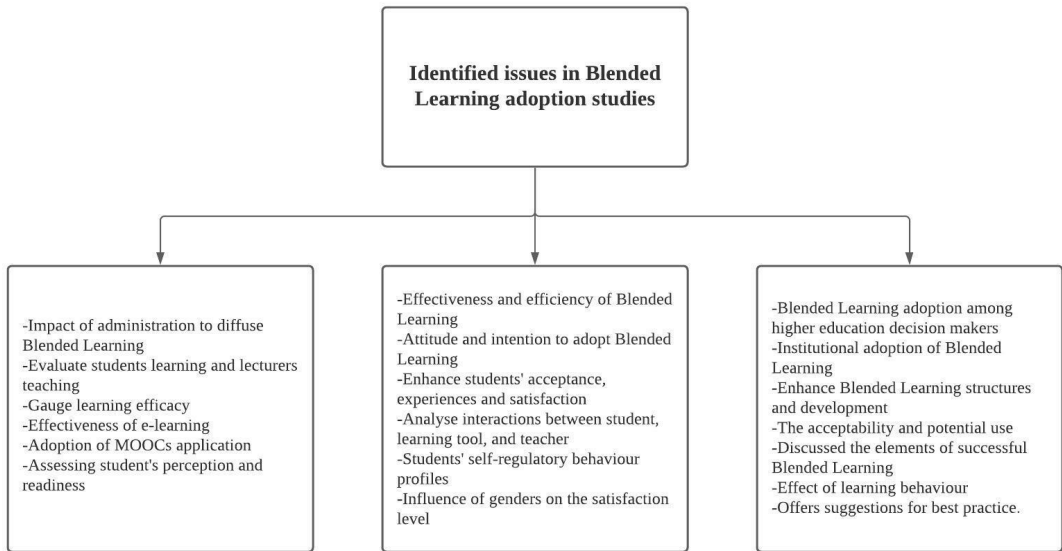
The architectural design studio in HEIs is affected and struggled to adapt to this event. Since design education and learning are focused on facilitating social interaction, it is assumed that teaching design online would be impossible (Bender, 2005; Fleischmann, 2015; Park, 2011; Wood, 2018). While there are relatively few online design courses available, other academic fields are rapidly expanding their offerings of entirely online programmes (Kumar, Kumar, Palvia, & Verma, 2019). Student skill sets and online studio design structure all have a role in the success of tutor-student interactions (Iranmanesh & Onur, 2021).

Students at the HEIs were delighted with their education and were strongly driven to succeed in their studies. Most students said that social presence, cognitive presence, and teaching presence supported their studies, enabling them to complete their education effectively. The same is true for academic performance. Unfortunately, due to Movement Control Order (MCO) during this pandemic, the students must adapt, and many of them have difficulty concentrating, lack of engagement, lack of desire, and require for a fast response from their instructors via online learning. As a result, students' learning performance has decreased, and they are anxious about their studies (Tan, 2021). A recent study by Chung et al. (2020) found that most participants do not wish to continue their class utilising online learning methods in the event of a COVID-19 pandemic. A few of the difficulties these students had was that the lack of connection to the internet and had difficulty grasping the subject matter of their courses.

On the other hand, tutors' willingness to adapt remains low, whereas students are more readily willing to experiment with new methods in their studio. Tutors should be prepared to incorporate technology into their innovative teaching and learning practices to increase the teaching and learning process (Zairul, M., 2018). As a result of the crisis, most teaching staff were pushed to adopt digital teaching methods. However, only a minority of them are fully equipped. An idea that has been offered is that future educators should be educated with digital teaching resources such as instructional design and digital literacy expertise to prepare them for the increasingly digital environment (Korkmaz and Toraman, 2020; Amir et al., 2020).

3.2 Blended Learning for Architectural Design Studio

Kim and Gurvitch (2020) believe that amid the pandemic, the repercussions are felt by how people live and that to continue giving education, we must use internet communication. Although they did identify difficulties in teaching and learning online, they also noted pedagogical and technological difficulties. Under Malaysia Education Blueprint 2015-2025 (Higher Education), blended learning approaches will be ubiquitous in HEIs. Students will gain by having solid cyberinfrastructure that enables the usage of videoconferencing, live streaming, and Massive Open Online Courses (MOOCs). Beginning with the conversion of typical undergraduate courses into MOOCs and requiring up to 70% of programmes to employ blended learning methods, the country aims to make online learning an intrinsic component of postsecondary education and lifelong learning (Ministry of Education Malaysia (MoE), 2015). Most blended learning studies were carried out in Malaysia between 2004 and 2020 (Anthony et al., 2020). The Malaysian government began implementing the blueprint as mentioned above for all higher education institutions in the country between 2015 and 2022. Several issues have been highlighted in the study. The cluster of concerns addressed in the 51 BL studies examined is shown in Figure 1.



(Anthony et al., 2020)

Figure 1. Cluster of concerns addressed in the reviewed Blended Learning adoption studies

Post-pandemic, or the effect of the pandemic on the field, provides an opportunity to see where undergraduate architecture programmes are headed. Synchronous and asynchronous education are blended in blended education, making it possible for learners to collaborate with institutions and experts worldwide. Setting up studio locations without a physical place is particularly challenging, but it is compounded further since studios are more reluctant to utilise accessible digitisation tools and communication platforms. Varma & Jafri (2021) argued that well-designed pedagogical frameworks incorporating online platforms and the use of new digital tools for architecture design representation and communication are critical for the successful and widespread adoption of blended learning in architecture education. On the other hand, conducting studio-based courses via an online platform result in a relatively low degree of satisfaction, as seen by similar global replies (Grover and Wright, 2020).

The majority of academicians believe that teaching design online is less effective than in-studio instruction. The most frequently cited disadvantage of online education was the inability to communicate with faculty members. In comparison, it was discovered that teaching theoretical courses is just as convenient and reliable as in-class instruction. Blended learning may be a viable option for integrating internet technologies into design studio courses. It is self-evident that teaching fundamental design and design courses involves various challenges and requires excellent work on tutors and students. Blended-learning courses, on the other hand, may be a realistic solution. Blended learning, which mixes traditional face-to-face studio time with synchronous collaboration via online meetings, is perhaps a viable approach for strengthening design studio classes using online technology (Ibrahim et al., 2021).

Nevertheless, it all begins before a solid understanding of the system's stakeholders: students, tutors, and HEIs. To put it another way, the starting phase is shallow. Chatti & Hadoussa (2021) stated, the problem of acceptability emerges for students in particular because of this digital learning. HEIs have only recently begun to adopt digital learning tools. Thus, just like every new technological invention, it will confront a considerable amount of difficulty when it launches. As learners interact with the digital learning system, they often discover habits they have or need to develop. They added that this forces them to work against their patterns, often leading to rejection or mistrust. While the system's effectiveness is clear, it is also apparent that it is simple to use. This concern expressed by many students is likely to heighten the sensation of dread further as the school remains in lockdown.

3.3 Technology Acceptance and Use for Architectural Design Studio Learning Engagement and Belonging

Learning Engagement (Kahu, 2013; van Uden et al., 2014) is a precondition for academic success. Cognitive presence has been connected to academic achievement in online environments. Motivation has been described as an ‘essential aspect to engage learners and increase students' learning experiences' (Gedera et al., 2015). Flow (Csikszentmihalyi, 1996) links aim and process through design and design learning experiences. As a result, a design student's learning, the possibilities of a particular design issue, and navigation through design practices have a lot in common.

Belonging refers to students' attachment, reciprocity, and mutual support for their peers, professors, institutions, and professions. A sense of belonging and social integration is critical to a student's overall welfare and learning ability (Baik et al., 2017; Baik et al., 2019). Gradually, academic duties grow to fit newer demands for pastoral care and its relationship to learning and the student experience (Laws & Fielder, 2012).

When students interact with one another and their teachers, they engage and connect. For projects and reviews, academia relied on Canvas discussion boards, Zoom meetings, and collaborative design platforms. Interaction is described as the interchange of ideas between people or the co-creation of objects. According to Tregloan et al. (2020), the interaction between students and teachers is vital for learning engagement and belonging. Architecture education relies greatly on collaborative encounters for professional development, whether expressly stated or not.

In other words, becoming a built environment professional requires enculturation into professional, industry-specific, and student communities and their discourses, behaviours, and institutions (Gilbuena et al., 2015). ‘The major arena where students explore their creative skills that are so desired by profession,' according to one report (Salama & Wilkinson, 2007). Interaction within the cohort in the studio becomes crucial to both student and professional development.

In this pandemic, newer technology and information systems are used to support the online learning environment. The better able stakeholders will shape policy and have a say in the decisions that affect them. There is evidence that social presence, cognitive presence, and teaching presence play a role in how interactive and collaborative learning techniques, notably online learning, are used (Tan, 2021). Moreover, the review by Anthony et al. (2020) shows that the ad hoc, technology acceptance model, information system success model, the unified theory of acceptance and use of technology, and finally diffusion of innovations theories are the most used theories by previous studies to investigate blended learning adoption. Thus, the studies provide insight into the theoretical framework for adopting blended learning in higher education, which has ramifications for students, lecturers, and administrators alike. Technology can assist students to study whenever and wherever they want (Chao, 2019). However, students may encounter difficulties regarding technology, particularly in terms of usage and acceptance (Kaliisa, Palmer & Miller, 2019). As a deduction, to verify that the student can adjust to the environment, the student's acceptance and use must be reviewed. Blended learning has been evaluated, and several models, frameworks, and adoption methodologies have been found. Preparing resilient blended learning for the architectural design studio, students' acceptance and use towards learning engagement and a sense of belonging need to be studied.

4.0 Conclusion

The discussion above described the architectural design studio approach associated with technology, acceptance, learning engagement, and belonging in the architectural design studio pre and during the COVID-19 pandemic. Looking forward to post-pandemic architectural design studios could leverage the experiences during the pandemic to adopt blended learning to design studios if the student's acceptance and use of technology are in good form. While providing students with even greater access to higher education and giving the institutions even more interaction with students (Vaughan, 2007; Erbil, 2020), blended learning is also helping to increase flexibility (Moskal et al., 2013; Alammary, 2019). Thus, Malaysia's architecture education in HEIs could be more resilient and well-prepared with some conscience of technology adoption for any emergency in the future. It is not just the curriculum

but also the resilience of HEI’s community to continue the education despite the pending disaster ahead. Moreover, it is not mission impossible because the ministry and HEIs, for instance, Universiti Teknologi MARA (UiTM), have prepared the blueprint called Education 5.0, which includes a digitalisation plan in teaching and learning.

Nonetheless, the limitations could be the capacity of the HEIs to provide the facilities, internet connectivity, and standard learning platform for students to utilize. From the perspective of academicians, there are challenges for them to catch up with the technology, level up their digital literacy, and design the curriculum with the adoption of the technology.

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Kelulusan daripada pihak tuan dalam perkara ini amat dihargai.

Sekian, terima kasih.

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Saya yang menjalankan amanah,

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