Transformation Open and Distance Learning (ODL) for Studio Based Architectural Design Courses

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Abstract: *Transitioning studio-based architectural design courses to an Open and Distance Learning (ODL) format requires careful planning and creative solutions to maintain the quality of the learning experience among university students. At ODL, it trying to re-design the programs and their implementation to suit with learners' actual needs. This paper examines transformation Open and Distance Learning (ODL) for Studio-Based Architectural Design Courses. The research findings support the use of Synchronous (Physical Design Studio) and Asynchronous (Virtual Design Studio) platforms to teach studio-based architectural design courses a constructive learning journey from start to end. ODL made available at a distance, adopting the traditional expression of distance learning into new technological situations.*

Keywords: *Open and Distance Learning (ODL), synchronous and asynchronous.*

1. INTRODUCTION

The pandemic Covid-19 has transformed education by causing learning at home to become the norm (Keswani et al., 2020). Technology's influence on education has revolutionized learners' actions and behaviors and transformed how they study and interact. In line with rapid development in technology for education, teaching and learning in higher education institutions are no longer dependent on traditional delivery methods. Hence, various technology and online applications available nowadays have opened up to more fun and engaging learning activities for learners. For studio-based architectural design courses, more student-centered learning is achievable. Through ODL programs, learners will be exposed to active learning as well as self-learning. Throughout the study process, learners will interact with peers via online discussion threads and engage themselves in in-depth discussions with lecturers through synchronous and asynchronous learning meetings. This study explored the best strategies of Open and Distance Learning (ODL) for Studio-Based Architectural Design Courses on higher education in universities, particularly the delivery of practical courses online. This paper aimed to determine the best approaches of distance learning for architectural design courses during and after the pandemic.

2. LITERATURE REVIEW

Open and Distance Learning (ODL)

Open and Distance Learning (ODL) is a platform wherein teachers and learners need not necessarily be present either at same place or same time and is flexible in regard to modalities and timing of teaching and learning as also the admission criteria without compromising necessary quality considerations. ODL, also called the distance education, or e-learning, is an online learning form of education in which the main elements include physical separation of teachers and students during instruction and the use of various technologies to facilitate student-teacher and student-student communication. Among the strengths of distance learning is the fact that they really provide easier access to course resources and offer greater

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convenience for the teacher and learner and offer flexibility in scheduling. Therefore, open and distance learning can be divided into synchronous and asynchronous learning.

Open and Distance Learning (ODL) for Studio-Based Architectural Design Courses Studio-based architectural design courses are a fundamental component of architectural education. All other supporting architectural subjects are normally organized to provide contributions towards Design Studio learning (Nik Lukman, 2012). These courses provide students with hands-on experience in designing buildings and spaces, allowing them to apply theoretical knowledge to practical design projects. This courses are immersive and demanding, requiring students to dedicate a significant amount of time and effort. However, they provide a well-rounded architectural education that equips students with the skills and knowledge needed to pursue a career in architecture or related fields.

Open and Distance Learning (ODL) for studio-based architectural design courses presents both opportunities and challenges. Studio-based courses are traditionally hands-on and require physical presence in a design studio. However, with the advancement of technology and innovative teaching methods, it's possible to adapt these courses for remote learning.

Implementing ODL for studio-based architectural design courses requires careful planning, effective use of technology, and a commitment to maintaining the quality of education. It also necessitates adapting teaching methods to the online environment while preserving the essence of studio-based learning, which emphasizes creativity, collaboration, and critical thinking in design.

3. RESEARCH METHODOLOGY

Methodology wherein research is conducted by qualitative approach by identifying the concepts used in the context of open and distance learning (ODL) especially for studio-based architectural design courses.

The researcher had also conducted the preliminary research on open and distance learning for studio-based architectural design through the literature review study, in order to get the information regarding the teaching and learning approaches of open and distance learning. Content analysis was also conducted systematically analyze and interpret the content of various forms of ODL, to ensure the quality of knowledge delivery can be improved, subsequently giving a positive effect even if the learning is not done physically and face to face.

4. CONCEPTUAL RESEARCH FRAMEWORK

Conceptual research framework constitutes of a researcher's combination of previous researches and associated work and explains the occurring phenomenon. It systematically explains the actions needed in the course of the research study based on the knowledge obtained from other ongoing researches and other researchers' point of view on the ODL.

Synchronous Learning
The synchronous learning environment provides real-time interaction, which can be collaborative in nature incorporating activities (Salmon, 2013) such as an educator's lecture facilitated with a question-and-answer session, which requires simultaneous student educator presence. On the other hand, synchronous learning provides an opportunity of educator-student and student-student interaction using a voice or text chat room and video conferencing, which facilitates face-to-face communication. In addition, a synchronous virtual classroom is a place for educators and students to interact and collaborate in real-time. Using webcams and class discussion features, it resembles the traditional classroom, except that all participants access it remotely via the Internet. Lessons can be recorded and added to the storage files. Thus, the synchronous open and distance learning happen in real-time.

Asynchronous Learning
Asynchronous open and distance learning is vice versa where it does not happen in real-time. It is executed to suit educators or students' schedule. Asynchronous can be described as a flexible open and distance learning environment. Asynchronous environment learning consists of study

materials in various forms (texts, slides, videos, assignments for completion, recordings) by the educators and the students themselves can access the materials anytime as long as they manage to meet the given deadlines. Frequent methods of asynchronous open and distance learning include self-guided lesson modules, lecture notes, virtual libraries, pre-recorded video or audio content, links to internet sources, and online discussion boards. Students work through the study material themselves, and only occasionally interact with instructors through social media, WhatsApp, or email. Thus, the asynchronous open and distance learning is expressed by flexibility, pacing and affordability (Doug W., 2021). Between synchronous and asynchronous ODL, both methods have their own pros and cons. Asynchronous online learning emphasizes flexible online learning such that students are not required to be online at the same time and generally facilitated by emails and discussion boards (Hrastinski, 2008). Meanwhile, synchronous online learning is currently gathering more attention than asynchronous online learning because synchronous online learning, with advanced technology, increases students' feeling of connection towards instructors and other students (Watts, 2016). For example, a conceptual framework might chart a new or unstructured phenomenon ODL that has previously been addressed in domains or disciplines in studio-based architectural design courses (Figure 1).

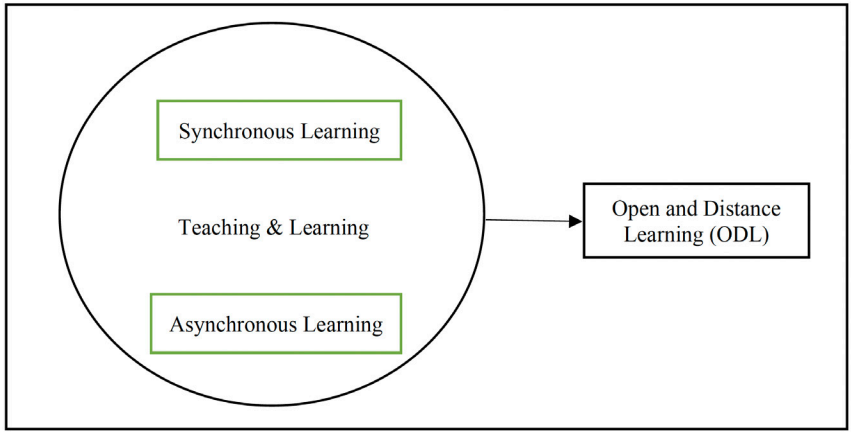

Figure 1: Research Framework

5. TRANSFORMATION OPEN AND DISTANCE LEARNING (ODL) FOR STUDIO-BASED ARCHITECTURAL DESIGN COURSES USING THEORY SYNTHESIS

A theory synthesis paper seeks to achieve conceptual integration across multiple theories or literature streams. This paper contributes by summarizing and integrating extant knowledge of a concept or phenomenon in Open and Distance Learning (ODL). According to MacInnis (2011), summarizing helps researchers digesting and reducing what is known to a manageable whole.

Using this theory may seek to increase understanding of a relatively narrow concept or empirical phenomenon. By using this theory, framed the common teaching and learning in terms of Synchronous (Physical Design Studio) and Asynchronous (Virtual Design Studio) within this big picture. Medium for ODL can be applied to studio-based architectural design courses through:

Synchronous Learning: Conduct live online design critiques, discussions, and workshops using video conferencing tools like Zoom or Microsoft Teams. This enables real-time interaction between students and instructors.

Asynchronous Learning: Provide pre-recorded lectures, tutorials, and assignments that students can access at their own pace. This accommodates different learning styles and schedules. Table 1, below is an example of transformation ODL for studio-based architectural design courses.

MEDIUM	Synchronous (Physical Design Studio)	Asynchronous (Virtual Design Studio)
TEACHING / LEARNING ACTIVITY	Individual Consultation with the Instructor	Accessible consultancies via sharing screen
METHODS	Appointments with students, whiteboard instruction, classroom discussion (2–5 students), student-conceived projects, differentiated instruction, reflective discussion	Appointments with students, remote collaborative board instruction, classroom discussion (larger group of students involved), student-conceived projects, differentiated instruction, reflective discussion
TOOLS & SOFTWARE	Printed drawings (limited due to printing costs), sketching, physical modeling	Digital drawings (no limits), digital sketching (Miro, ZOOM, MS Teams), sharing photos of hand-drawn sketches and physical models, taking control of the screen (MS Teams), sharing digital 3D model (BIM Cloud, Autodesk Share)
TEACHING / LEARNING ACTIVITY	Site Survey	Virtual site visit
METHODS	Field trip, photography, taking measurements, visual observations, use of community or local resources, interviewing	Virtual field trip, video lesson, visual observations, use of virtual community or digital resources (e.g., Facebook Groups)
TOOLS & SOFTWARE	Drawing tools & clipboard, tape measure, laser measure, camera & mobile phone (video walk-through, taking digital images, mobile measuring apps)	Google Earth, Google Maps, Copernicus, virtual 3D city model, GIS Databases, Thing link, Facebook, Instagram
TEACHING / LEARNING ACTIVITY	Study Trip	Virtual tour and / or online meetings with practicing architects
METHODS	Field trip, photography, visual observations, on-site discussion, lecturing, guest speakers, case study, interviewing	Virtual field trip (more locations are reachable), online discussion, lecturing, guest speakers (from all around the world), online discussions, case study, interviewing
TOOLS & SOFTWARE	Camera & mobile phone (video walk-through, taking digital images)	Virtual Tour sites, Google Earth, Google Maps, Google Arts & Culture, virtual 3D city model, online videos, Zoom, MS Teams
TEACHING / LEARNING ACTIVITY	Tactile exercise of physical model making	Digital 3D Modeling

METHODS	Hands-on activities (kinesthetic learning), direct instruction, student-conceived projects, differentiated instruction, reflective discussion	Hands-on activities (kinesthetic learning), direct instruction, student-conceived projects, differentiated instruction, reflective discussion
TOOLS & SOFTWARE	Sketches, physical models	Sketches, physical models, 3d photos and videos of the physical models, 3D Design Software (e.g., Sketchup, Rhino, ArchiCAD, AutoCAD, Autodesk 3ds Max, Rhino 3D, Revit Architecture, Grasshopper)
TEACHING / LEARNING ACTIVITY	Pin-up board project presentation	Project presentation on Miro Smartboard
METHODS	Student presentation, debates, role playing, reflective discussion, exhibits and displays	Remote student presentation, online debates, role playing, reflective discussion, exhibits and displays
TOOLS & SOFTWARE	Whiteboard, pin-board, slideshow	Slideshow, Prezi, 3d photo, Zoom, MS Teams, Miro Smartboard
TEACHING / LEARNING ACTIVITY	Collaborative design in studio	Collaborative Design via BIM Cloud, Miro Board, etc.
METHODS	One-time design task, team-building exercises, collaborative learning spaces, problem solving activities, hands-on activities, student-conceived projects, DIY activities	One-time design task, team-building exercises, collaborative learning spaces, problem solving activities, hands-on activities, student-conceived projects, DIY activities
TOOLS & SOFTWARE	Sketches, physical models, pin-board, slideshow	Digital sketches, collaborative 3D digital models using 3D Design Software (e.g., Sketchup, Rhino, ArchiCAD, AutoCAD, Autodesk 3ds Max, Rhino 3D, Revit Architecture, Grasshopper), Miro Smartboard, BIM Cloud, Autodesk Share, slideshow
TEACHING / LEARNING ACTIVITY	Student Portfolio	Student Portfolio on Miro Smartboard
METHODS	Student-conceived projects, problem solving activities, individual projects, research project, case study	Student-conceived projects, problem solving activities, individual projects, research project, case study
TOOLS & SOFTWARE	Set of hand-drawn and printed drawings & visualizations (limited due to printing costs)	Set of hand-drawn and printed drawings & visualizations (no limits), documented each step on the way and presented in an organized way (e.g., on Moodle platform)
TEACHING / LEARNING ACTIVITY	Individual design in studio	Individual design in studio (performed remotely)
METHODS	One-time design task, individual projects, student-conceived projects, designated quiet space, problem solving activities, hands-on activities, DIY activities	One-time design task, individual projects, student-conceived projects, designated quiet space, problem solving activities, DIY activities

TOOLS & SOFTWARE	Sketches, physical models, pin-board, slideshow	Digital sketches, 3D digital models using 3D Design Software (e.g., Sketchup, Rhino, ArchiCAD, AutoCAD, Autodesk 3ds Max, Rhino 3D, Revit Architecture, Grasshopper), Miro Smartboard, slideshow
TEACHING / LEARNING ACTIVITY	Case study (referenced architectural and urban project)	Case study (referenced architectural and urban project)
METHODS	Research project, student presentation, set of printed drawings, student-conceived projects	Research project, student presentation, set of printed drawings, student-conceived projects
TOOLS & SOFTWARE	Whiteboard, pin-board, slideshow	Slideshow, Prezi, Zoom, MS Teams, Miro Smartboard, videos, materials from presentation documented each step on the way and presented in an organized way (e.g., on Moodle platform), Google Maps, virtual 3D city model, GIS Databases, Thing link
TEACHING / LEARNING ACTIVITY	Lecturing/Direct instruction	Remote Lecturing/Direct instruction
METHODS	Lecturing, guest speakers (limitations), case study, direct instruction	Lecturing, guest speakers (no limitations), case study, direct instruction
TOOLS & SOFTWARE	Whiteboard, pin-board, slideshow, interactive tools (e.g., Kahoot!)	Slideshow, Prezi, 3d photo, Zoom, MS Teams, Miro Smartboard, recorded lecture, materials form lecture and instructions documented each step on the way and presented in an organized way (e.g., on Moodle platform), interactive tools (e.g., Kahoot!)

Table 1: Transformation ODL for studio-based architectural design courses.

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7. CONCLUSION

In line with rapid development in technology for education, teaching and learning in higher education institutions are no longer dependent on traditional delivery methods. Hence, various technology and online applications available nowadays have opened up to more fun and engaging ODL activities for learners. More student-centered learning is achievable. Through ODL for studio-based architectural programs, learners will be exposed to active learning as well as self-learning. Throughout the study process, learners will interact with peers via online discussion threads and engage themselves in in-depth discussions with lecturers through synchronous and asynchronous meetings. Instructors and learners should incorporate technological and innovations from different fields to organize ODL and enhance the quality of education.

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