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Disruption of IoT in Adapting Online Learning during the Covid-19 Pandemic

Abstract

When it comes to education, the COVID-19 epidemic has had a major effect, particularly on distance learning techniques that must be completed online. It also applies to Architecture and Interior Design students in the planning and design studio lecture activities, which were formerly carried out offline in the studio but are now required to be carried out online from their individual residences, as part of the online learning methodology. Various difficulties encountered in architectural and interior planning, as well as design studio lectures, need students' adaptation via the use of virtual reality and digital technology. There are numerous restrictions in terms of visual and digital communication, ranging from the use of technical equipment to the facilities held by lecturers and students. The research used a qualitative descriptive approach, in which data was gathered via questionnaires, with the respondents being architecture and interior design students who answered the questions. According to the findings of the research, the adaptation of online lectures is not only a virtual and digital issue, but also a physical and non-physical one that requires consideration. When it comes to architectural and interior planning and design studio courses, virtual and digital changes have an impact on the learning process and the quality of learning results. Physical adaptation necessitates the provision of supporting resources in the form of tools and equipment to aid in the delivery of classroom lectures. Non-physical adaptation includes changes in time, patterns and methods of learning, behavior, psychology, and the internet network, as well as changes in the internet network itself. In future studies, it is necessary to do more in-depth study on behavioral and psychological adjustments and perspectives.

Keywords: Architecture, COVID-19, Digital Adaptation, Interior Design, Online Learning.

Introduction

Not everyone is prepared to deal with this situation when it comes to transitioning learning techniques from offline to online. As a result of the COVID-19 epidemic, everyone is forced to adapt via the use of digital and online media, including lecture activities for drawing studio courses for architecture and interior design students. The ability to utilize technological media in the design process is needed not just for architecture and internal students, but also for those who work in the design industry. Various software programs used in the design drafting process need the development of specialized abilities. When the design advice process may be completed on drawing paper rather than digitally, digital adaptation for studio courses becomes a significant issue. Due to the fact that it needs digital media, online communication

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becomes restricted since not all students or lecturers have access to or are able to utilize these devices or facilities. As a result, the communication process in help is not as effective as it might be. Many things are not communicated in a suitable manner. Furthermore, there is the potential of creating divergent views between students and professors.

Due to the fact that each student has a unique point of view, there are a variety of views among architecture and interior design students about online learning techniques. Depending on the students' backgrounds, perceptions can arise ranging from their geographical location, their ability to use digital media and software, the ease and availability of internet network access, the availability of facilities and digital media, communication between lecturers and students, comprehension and comprehension of students, to the general behavior of students, who tend to think that everything should be quick, easy and practical.

Previous research conducted at the Islamic University of Indonesia in 2021 regarding studio course learning with the collaborative method, research conducted at Ciputra University in 2020 on blended learning in the architectural study program, and research conducted at the University of Western Australia in 2019 on the influence of online media on architecture student learning, among others.

This study will look at how students adjust to digital environments and how they interpret online lectures for studio classes in architecture and interior design study programs, specifically. Specifically, the goal of this research is to map the issue of adapting online lessons for studio courses in the Architecture and Interior Design study program so that it may be used as a foundation for assessing how to enhance the quality of online learning in the future. Additionally, data on student perception is required for lecturer assessment materials in order to manage online learning and accomplish learning goals in order to achieve learning objectives.

Literature Review

As a result of the World Health Organization's determination in January 2020 that the COVID-19 outbreak constitutes a public health emergency that requires worldwide attention, different measures have been undertaken by all nations to prevent the spread of this high-risk virus. The COVID-19 epidemic has altered the manner in which people live their lives. Numerous anti-transmission efforts have been implemented, one of which was the maintenance of physical distance, which later evolved into social distancing (Pranata et al.,

2019). The adoption of social distance results in a shift in national behavior in a number of different nations (Galea et al., 2020).

A. The Effect of the Pandemic on Lectures

In the long run, changes in behavior brought about by the adoption of social distancing will have an impact on the world of education, particularly on the lecture process at universities. In order to minimize the danger of Covid-19 spreading, the World Health Organization advises that activities that create crowds be discontinued, such as evaluating face-to-face learning methods. Many nations across the globe have temporarily shuttered their educational institutions, and this national closure has an effect on more than 91 percent of the world's student population, according to the United Nations (Pragholapati, 2020). "On the Implementation of Education Policies in the Emergency Period for the Spread of Covid-19," issued by the Indonesian Ministry of Education and Culture on March 24, 2020, and titled "On the Implementation of Education Policies in the Emergency Period for the Spread of Covid-19," is concerned with the online distance learning process carried out at home in order to ensure that the Covid-19 pandemic does not pose an obstacle to the continuation of teaching and learning activities with the selection of appropriate learning methods (Hatmo, 2021). In order to continue to be able to educate students, online learning and working from home are required for lecturers (Argaheni, 2020). During the implementation phase, lecturers arrange facilities, infrastructure, and media for teaching materials in order to ensure that the process of online lectures runs as smoothly as possible. Lecturers are also expected to provide engaging, interactive learning material that incorporates technology and aids in effective communication skills development (Rumaksari, 2021).

This online learning takes place both synchronously and asynchronously, and it is accomplished via the use of web services and learning apps. Synchronous learning is accomplished via the use of video conferencing systems. The use of Zoom or Google Meet apps allows for real-time interaction and communication between lecturers and students throughout this learning process. Asynchronous learning is carried out via the use of Google Classroom, Edmodo, WhatsApp, and e-mail, among other platforms (Cardiac et al., 2019).

B. Digital Adaptation

The novel Coronavirus Disease 2019 (Covid-19), which originated in the Chinese city of Wuhan in the province of Hubei, has spread quickly across the globe. The World Health

Organization (WHO) designated this event a worldwide pandemic on March 11, 2020, the date of the incident (Cucinotta & Vanelli, 2020). This necessitates the use of self-quarantine at home in order to break the chain of transmission of the virus. This scenario has a negative impact on all operations in a variety of areas, including education, which is one of them.

Because the Covid-19 pandemic's environment never ends, all human behaviors that would normally take place face to face have been altered such that they no longer take place face to face. Digital media is the preferred and anticipated medium, and all activities are compelled to make use of it. Everyone must participate in this new adaption by utilizing different apps such as WhatsApp, Instagram, Zoom, Ruangguru, marketplace, and others to keep up with the times.

C. Virtual Communication

Virtual communication is accomplished via the use of internet technologies. Cyber media are any places where virtual communication takes place, such as websites, e-mails, internet forums, blogs, and social media platforms, among others (cybermedia). Because of the presence of cyber media, the development of a virtual community is encouraged (virtual community). The internet enables virtual communication amongst people who may collaborate and engage in order to elicit virtual feelings in others (Junep, 2018). The virtual community maintains virtual touch with the same topic, for example, a unique group discussing learning in a virtual environment.

There is a pattern to communication. Communication patterns are described as a pattern of interaction between two or more individuals that involves sending and receiving messages in an acceptable manner so that the intended message may be understood (Djamarah, 2004). A communication network, or a pattern of human contact, may be classified into five different kinds (Tubbs, 2001), consist of:

1. Wheel Interaction Pattern

The wheel interaction pattern is centered on a central person who serves as a mediator for communication amongst members of the group by acting as a focal point. As a result, in this network, a leader acts as the focal point for all communication inside the group. In this design, the leader takes on the role of the center, allowing him to freely interact with all of the members. Members, on the other hand, are not permitted to exchange information with one another and must communicate via the leader.

2. Chain Interaction Pattern

The chain interaction pattern is a scenario pattern in which three individuals are only able to speak with the person who is directly next to them. The chain pattern adheres to the formal chain of command to an extreme degree.

3. Y. Communication Pattern

The Y communication network is a pattern that is adhered to a system that is almost identical to the chain interaction pattern in terms of its structure. Y, on the other hand, occupies a midway place in the communication pattern, serving as an intermediate, while the center position is unable to reach all members.

4. Circle Communication Pattern

It is a more dynamic pattern of communication in terms of the dissemination of messages since everyone is linked and may speak with each other with two individuals adjacent to him in the circular communication pattern.

5. All Channel Communication Pattern

The All Channel pattern is a pattern that includes open channels, which means that anybody may communicate with anyone else while using this pattern. This design is the most flexible since there are no barriers or middlemen that may obstruct the flow of information in this structure.

D. Alternative Learning Media

Online learning media apps have also been made available by the government and the commercial sector. The Ministry of Education and Culture has published a circular, titled Circular Letter of the Minister of Education and Culture Number 9 of 2018, on the use of Learning Houses. The circular may be seen here. In addition, the government offers a television-based learning program known as TVRI, which is available to the public. Meanwhile, online tutoring services such as Zenius, Kahoot, Teacher's Room, Klassku, and other similar services are available in the private sector. The implementation of education and communication in education during the COVID-19 epidemic has also been impacted favorably as a result of these initiatives.

All conversations are now conducted entirely online. As a result, virtual learning is the only viable option for overcoming communication difficulties in the classroom setting. Virtual learning, as a medium of communication in learning, is, nevertheless, inextricably linked to

the difficulties that students face throughout the learning process, such as the signal being interfered with in students who reside in the 3T region, which is an example of this. This is often a barrier to effective communication in the classroom. Occasionally, even in metropolitan locations, signals may become a stumbling block during the transmission of learning data in the 3T environment. Education professionals, on the other hand, must take a variety of steps to overcome these challenges. Another is the usage of several apps in a single lesson, which is another example.

E. Online Planning and Design Studio

The study of the planning and design process is at the heart of architecture education, and it is where students learn the most (Anggraini, 2020). In order to accomplish the learning goals, cooperation between lecturers and students is required throughout the process of instruction. Learning success may be achieved via collaboration between professors and students using a variety of technological mediums and online networks. This is due to the fact that the learning pattern has undergone a transformation from a teacher-centered to a student-centered notion, in which students no longer consider professors to be sources of information, but rather as facilitators of cooperation. Students in studio classes often go through the phases of the learning process shown below:

Figure 1.

Design stages

The design process and phases in studio courses that are taught online are the same as those that are taught offline in a live studio environment. All phases of the design process are carried out with direct guidance, one by one, for each student in turn, over the course of the semester. The studio course is a course that is built on the process of designing and sketching. When conveying the design process via online pictures, such as Google Meet media or Zoom sessions, it is necessary to use specific media to communicate the process.

3 to 5 credits are usually assigned to studio courses, depending on their length. SKS is an abbreviation for Semester Credit Units. One credit is equal to 160 (one hundred and sixty) minutes of study activities each week for a semester (160 minutes per credit). (50 minutes of face-to-face, 50 minutes of structured assignments and 60 minutes of independent commissions) (Primadewi et al., 2021). If a course includes five credits, it implies that face-to-face activities with lecturers will take 250 minutes, which is equal to 4 hours and 10 minutes of actual time. This may take a long time if it is done online since it takes time for students and lecturers to establish a virtual connection. Technical modifications were made to the SKS idea at the time of online lectures, including changes to the medium, platform, timetable, and time/duration. According to Permenristekdikti No. 44 of 2015, which outlines the requirements for higher education, the learning concepts of SNDIKTI include interactive, holistic, integrative, scientific, contextual, thematic, practical, and student-centered learning. University administrations, faculty members, and students all share responsibility for achieving results in accordance with the requirements of the law.

Learning via online contacts as a result of the epidemic cannot be compared to face-to-face learning encounters, and this is especially true for children. This pattern of studio learning, in which face-to-face lecturers directly assess learning results, is difficult to replicate in an online study setting. Studio courses, on the other hand, are required courses in the fields of architecture and interior design. When the studio is put into action, it will be based on a workshop model that emphasizes training that is geared toward processing ideas to address issues in particular environmental settings.

Among the phases of the architectural process are the stages of comprehending (understanding) the architecture, experiencing (experiencing) the architecture, and creating (creating) architectural forms (Devins et al., 1990). Instead of the traditional workshop-style learning model, the idea of distant learning via electronic media, often known as e-learning, has taken the place of the studio learning paradigm. The online learning system has both positive and bad elements, which are both important to consider.

The use of electronic media, which shortens the contact route between students and professors, is one of the positive aspects. Cloud-based storage and retrieval of information allows everyone to search for information at the

same time, while also offering a dynamic platform for the help process.

The disadvantages of the online studio approach include the fact that students tend to disregard lecture content delivered electronically, and that lecturers expect all students to listen to and study all theories given via electronic means, among other things. Though not always the case, an unstable internet connection can cause material to be delivered late, not all students and lecturers progress in the use of electronic media, electronic media fails during the discussion process in the context of experiencing and creating in architecture, and what lecturers convey may not always be the same as the perception understood by students, among other things.

In architecture online studios, thinking digitally and digitally is a challenge, particularly for level 1 and 2 students who do not grasp size, proportion, and other fundamental design concepts, among other things (Purwantiasning, 2016). Not all students are able to incorporate this digital metamorphosis into their creations in the same way. Students have restrictions when it comes to surveying and seeing a place in person while learning about it online. The current site and local climatic circumstances are often assumed to be adequately studied by students via intuition, even though further logical and intellectual study is required to ensure that the digital transformation process runs smoothly and successfully. Because of the abundance of knowledge available on the internet, design students also have difficulties while consulting. Drawing studio tasks are often associated with information found on the internet, resulting in a reduction in student originality. Emotion is required from the designer, in the form of transformation of architectural design drawings, in order for digital literacy to be successfully achieved. To put it another way, they are claiming that emotion plays an important part in the design process. Students that are technologically literate and have strong emotions will create beautiful designs that are full of personality and personality (Sugiyono, 2012).

Research Methods

A. Research Method

With the help of case studies of Distance Learning Architecture and Interior Design Students, we are putting our study on Digital Adaptation and Students' Perceptions of Online Lecture Methods into action.

B. Research Type

It is conducted using qualitative research methods, which results in social studies that are concerned with the quality and quantity of the object of study, which are the facts and phenomena that occur in online learning (Dewanti et al., 2014).

C. Research Approach

It is necessary to use the research method in a descriptive manner in order to accurately explain the nature and state of the research object. It is the goal of data collecting to describe complete and precise facts that are relevant to the issues that are the subject of the research project. Qualitative research is to gather information and explain it fully and comprehensively in relation to the topic being addressed (Moleong, 2007).

D. Data Collection Techniques

Data on digital adaptation and perceptions of architecture and interior design students, as well as a case study of distance learning for architecture and interior design students, were gathered via a combination of primary and secondary data acquired by the researchers (Zaman et al., 1998):

a) Using the Google form approach, primary data is collected directly from students who have responded to a list of questions that have been created in the form of both structured and open questions, so that students may select responses based on their own personal experiences.

b) Secondary data is collected from students using a Google form, and students are encouraged to look for additional data that is relevant to the study issue.

E. Research Location and Research Time

In this study, 11 campuses with architecture and interior design study programs implemented a distance learning system (PJJ) in a network or online, which frees up the field implementation techniques to lecturers with a variety of system options, be it Online PJJ in a Video-Based System or Data-Based PJJ System, and either simultaneously (Synchronous) or not simultaneously (Distributed) were investigated (Asynchronous). During the implementation of Large-Scale Social Restrictions, the study is conducted at a flexible time that is determined by the lecturer's admission schedule, which is organized in turns so that there is no accumulation of courses at one time.

F. Population and Sample

The population refers to the total number of units or components of the topic of study that

have been studied in total. The Sample is a tiny portion of the total study object, which reflects the presentation of the population as a whole. Gregory describes the population as a complete entity relevant to the issue under investigation, rather than as a collection of individuals (Djarwanto, 1990). 'The Sample' refers to a subset of the population whose characteristics are being investigated (Piliang, 1998).

i. Population

In this qualitative study, 121 respondents with grades in 2015, 2016, 2017, 2018, 2019, 2020, and 2021 from 11 campuses participated in studio course learning utilizing the Distance Learning Method or Online.

ii. Sample

The students that participated in this study were selected from the Architecture and Interior Design program. In all, there are 11 campuses with 121 responders in 2015, 2016, 2017, 2018, 2019, 2020, and 2021, which provide architecture and interior design study programs, and they are all located in the United States.

G. Data Analysis

Data collection, grouping, and sorting from the Google Form Students of Architecture and Interior Design in the studio course to identify what pattern facts are important to learning and may be communicated as insights to others is the data analysis technique used in this qualitative study. Qualitative data analysis, according to Bogdan and Biglen, is a collaborative endeavor that involves working with and organizing data, dividing it into manageable pieces, synthesizing, looking for and discovering what patterns are important and what is learnt, and choosing what to communicate. Others may be affected by this.

Results and Discussion

Global students are being influenced by the advancement of information technology, which is causing a change in societal ideals. Societal transformations are characterized by social transparency, which is a condition of the elimination of social categories, borders, and social hierarchies that formerly existed and contributed to the formation of societies. Following that, the information network becomes transparent and virtual when there are no longer any moral categories that tie it and no longer any value measurements that constrain it. Because individuals who are caught in the communication process in the virtual world may get absorbed in

it and carried away by the current communication styles, it is not unusual for them to be able to seem as another figure, which is very different from the actual world in daily life (Reigeluth, 1989). In order to get a better understanding of the rules for online lectures at various schools that offered online courses during the epidemic, we conducted a poll. In this adaptation research, information on students and campuses was gathered. The result can be observed in Figure 1, where campuses and students are teaching online courses, particularly students enrolled in the architecture and design study program's interior design course.
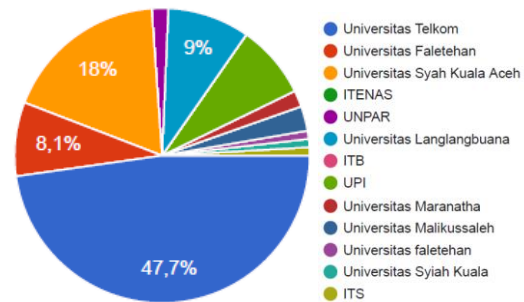

Figure 2.

Origin of Campus

Examining the Effectiveness of Online Education Students in the fields of architecture and interior design may communicate virtually for study courses. Effective learning has many qualities, which include: being active, complex, providing differentiated treatment to individual students, and providing differentiated therapy according to the learning environment. Consider the following criteria for successful learning: accurate mastery of the subject, rapidity of performance, rate of transmission of knowledge, and a high rate of retention of the information (Warsihna, 2016). Figure 1 shows the stage of the study process at which it was necessary to survey how many levels of students in order to determine the efficacy of surveying how many levels of students.
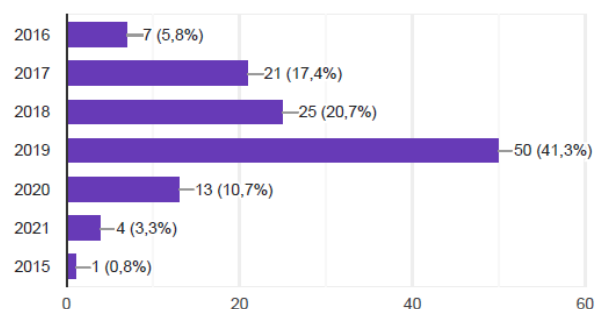

Figure 3.

Beginning to Enter College

A developed nation is also distinguished by the advancement of its educational system. PISA (Program for Worldwide Student Assessment) is one of the international assessment organizations (Programme for International Student Assessment). PISA is a set of measures taken in a country's education sector with the goal of evaluating the country's educational system in three categories, namely mathematics, science, and literacy.

The use of information technology in the learning process is the most effective method to address literacy issues (Elyas, 2018). The usage of this technology may take the shape of e-books, the incorporation of e-learning into the learning and learning process, or a combination of these methods. Students' scientific literacy is thought to be improved via the use of e-learning and results in a higher level of consistency in the learning experience for students (Arief, 2009).
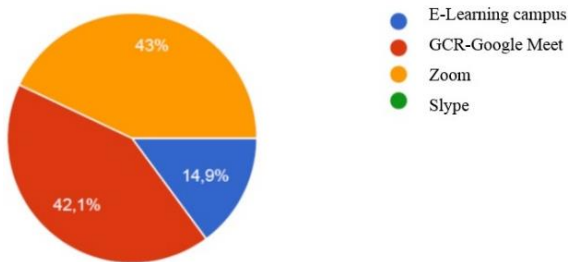

Figure 4.

E-Learning Platform

Media include all kinds of communication, including written and audio-visual materials, as well as the technology used to deliver them. In the English language, media is the plural version of the word medium, which refers to an intermediate or a mode of communication.

When you look at media, you will see that the word is derived from the Latin medium, which means "between," and that anything that delivers

information to the source via the intermediary of the original is considered media. As a result, Briggs thought that media may include a wide range of components that can assist pupils in the learning process (Dulkiah et al., 2020). In this research, a student survey was performed to determine if students understood and interacted with one another throughout the online or offline learning process. The results of the survey are shown in Figure 4:
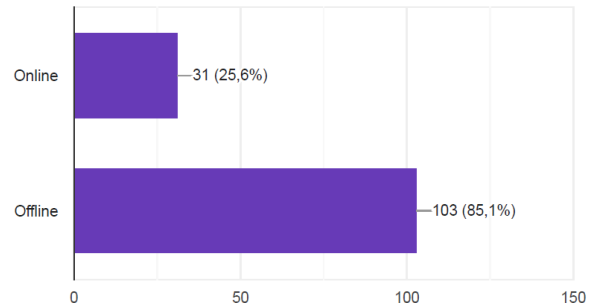

Figure 5.

Interesting studio learning system

Learning media is a component of the learning component and eventually becomes an essential element of the learning process due to the fact that every lecturer must become proficient in it. Essentially, all teaching and learning activities (KBM) are a kind of communication process. The transmission of messages/information from the source to the receiver of the message is accomplished via the use of an intermediary, referred to as the media.

However, technological complexity cannot be without its drawbacks, which means that there will be barriers in the learning process, such as those shown by the survey findings in Figure 5 regarding difficulties in online learning.
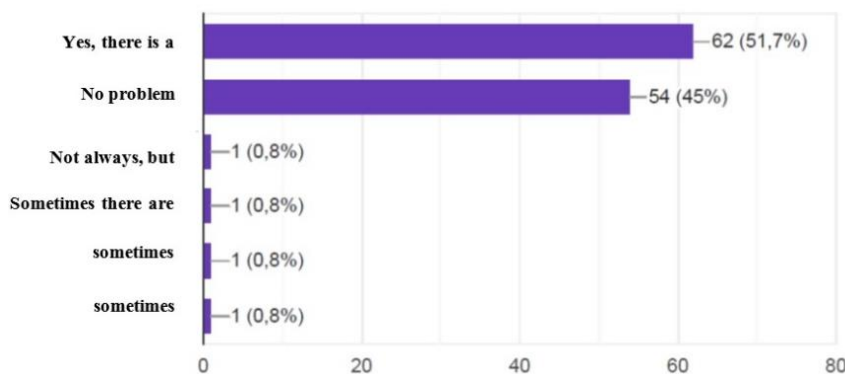

Figure 6.

Constraints on the use of the e-learning platform

Students' social adaptation to barriers in online learning, as well as the impact of these obstacles on elements of family life, are the focus of efforts made by the Department of Educational Technology. Additionally, research was conducted to determine the effect of the pandemic on the education sector (Karwati, 2014), It investigates the issue of a significant number of educational institutions being forced to close (temporarily) in order to contain the spread of the epidemic. Due to interference with the natural learning process between students and instructors, along with the implementation of different learning programs, a rise in the psychological load, particularly on parents, as well as a reduction in the quality of students' abilities was seen.

Several studies performed before the pandemic found significant disparities in the outcomes of face-to-face and remote learning. That there are specific difficulties in the administration of online learning that studio courses must overcome is shown by this example.
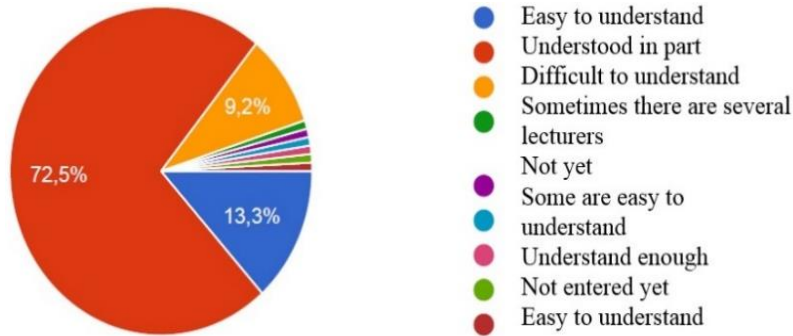

Figure 7.

Students' understanding of Studio courses

Explain that difficulties occur for both students and lecturers, such as an increase in the number of tasks (Sari & Mayrita, 2020). Another stumbling block is the restricted access to information that is made possible by limited signal strength and limited gadget capabilities. As already stated, the boredom associated with learning during the Covid-19 epidemic is a concern (Sari & Mayrita, 2020). Students have trouble comprehending the content because of a lack of diversity in the techniques employed by lecturers, particularly studio course instructors during the work help stage, according to the findings.
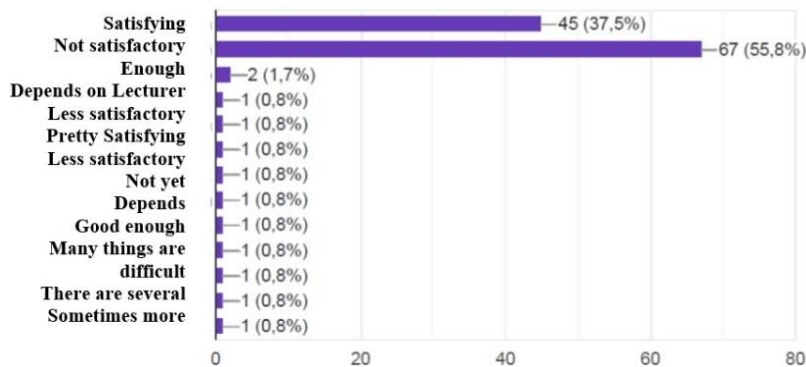

Figure 8.

Quality of Online Studio Task Assistance Process

Aside from that, boredom can arise as a result of too many tasks, the absence of study partners as a result of distance learning, reduced concentration in learning as a result of staring at the cellphone/laptop screen for an excessive amount of time, the restriction of quota, and a home environment that does not promote a learning environment.
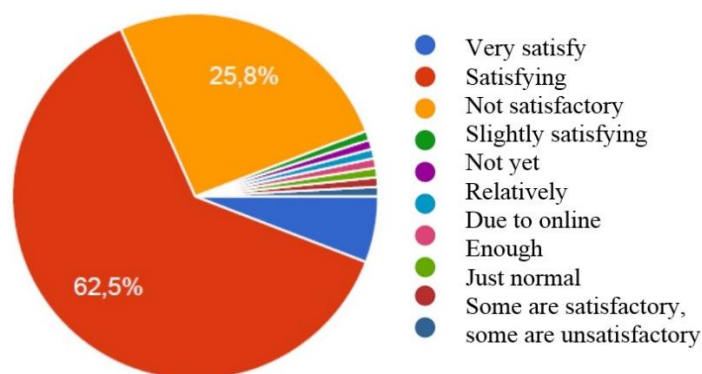
Figure 9.

Results of Online Studio Tasks Done

As previously mentioned, a variety of learning techniques and media are required to overcome these issues. In this version, the teacher's knowledge and abilities in information technology are adapted to the teacher's command of and proficiency in utilizing popular platforms such as e-mail, Zoom Meeting, Google Classroom, Whatsapp, and YouTube. In addition to experimenting with various mediums, it is necessary to experiment with different kinds of activities. According to the statement, this is true[36] In order to prepare effective online learning strategies that are supplied with suitable media and learning techniques, instructors must take their responsibilities seriously themselves.

Conclusions

The widespread situation that necessitates online learning has created difficulties for a variety of parties, including lecturers, students, and the parents of students. In addition to internet limits, teaching and learning activities are restricted, and learning techniques and media become repetitive, causing pupils to lose interest in their studies.

Students in the architecture and interior design study program were asked to rate their acceptance of electronic learning technology as an alternative learning medium. The percentage of acceptance of e-learning technology as an alternative learning medium was obtained for eight variables using GFrom, including: (1) Early entry to college, with an average score of 41.3 percent in the 2019 category; (3) The average score for e-learning technology; and (4) The average score for the 2019 category.

A number of variables influence the acceptance of e-learning technology as an alternative learning medium for students enrolled in architecture and interior design study programs, including: (1) e-learning self-efficacy, which is defined as the desire of students to obtain information through e-learning; (2) the complexity of e-learning (complexity); (3) limited time (lack of time) in using e-learning; (4) the perception of usefulness in using e-learning in daily activities; and (5) perceived ease of use When it comes to completing assignments, these five variables influence whether students will utilize e-learning or not, and if they will use e-learning in their daily lives. Asynchronous e-learning, such as the Google Meet application and Zoom for the learning process on campus, may be included in future studies, and it is essential to assess the user interface.

Acknowledgement

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