

# Students Perceptions of Digital Disruption in Learning

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## ABSTRACT

Digital disruption does not only occur in the sector of goods and services industry, but also in education. One way to deal with digital in education is to make improvements in learning activities. This study aims to explore students' perceptions of digital disruption in their classrooms. This phenomenological study describes students' perceptions of digital disruptive in learning. The application of learning, the use of the internet as a source of learning, and the use of Augmented Reality (AR) technology received positive responses from students, in the sense that students were interested and expected to continue to be applied by adjusting the latest technological developments. Online learning is perceived as more effective and efficient than conventional learning. While a focus on student perceptions, this paper also discusses how universities facilitate students in addressing real sustainability problems.

**Keywords:** Digital Disruption, Digital Learning, Perception

## 1. INTRODUCTION

The development of technology towards digital has an impact on the instability of the business value of a product that already exists. An example of the application of digital technology in Indonesia is an online transportation system such as GRAB and GO-JEK which has changed the previous conventional transportation business such as pedicab and "angkor" or minibus. This change gets a positive reaction from the Indonesian people. Online transportation is considered cheaper, faster, convenient, and safe than conventional transportation [1]. If the providers of transportation services still survive with the old business pattern, then they can be abandoned. This condition is called digital disruption.

Disruption is defined by Christensen as a competitive response theory [2]. Digital disruption is acknowledged as a threat in most industries or business [3, 4]. Digital technology transforms industries and companies need to take these developments seriously. Matzler, et al. [5], digital convenience can even have an impact on someone's job loss because it is replaced by an automated system or application. However, the problem in the future could not be the lack of employment, but the shortage of skills that will demand new jobs.

By one popular estimate, ultimately end up 65% of children entering primary school today will working in completely new job types or do not even exist yet before. therefore, a step towards preparing individuals for the future economy is providing quality education for all [6]. Digital disruption does not only occur in the industrial sector but also in education. Nowadays, learning innovations refer to the use of digital technologies. Selwyn [7], digital technology has become part of education in ways that were difficult to imagine even a few years ago. Teachers and students have unprecedented access to information and communication through various digital devices.

Digital technologies have created new markets and disrupted many others [8]. Disruptive innovation is not necessarily a disruptive innovation because it can be a form of continuous innovation [9]. This also happens in education, especially in the learning process. A teacher is demanded to be able to innovate learning continuously. Thus, digital technology could promise a lot in terms of improving the quality of learning. To prepare students for future challenges, this paper aims to determine students' perceptions about digital disruption in learning.

## 2. LITERATURE REVIEW

### 2.1. Digital Disruption in Learning

Digital disruption is characterized by digital transformation, i.e. the change related to the application of digital technology in all aspects of society's life. Skog, et al. [10] stated that digital transformation is an aggregated effect that both triggers and is spurred by numerous digital innovations, and some of which may generate digital disruption. Digital disruption is generally perceived from the perspective of firms that are heavily invested in old conditions or planned course of development is interrupted.

Digital technology is now proliferating not only brings industries into disruptions, but also education. This is certainly a concern for many academics. Selwyn [7] discourses of digital education have proliferated since the introduction of first 'standalone' computers into high school and university classrooms in the 1960s. In the current digital era, many emerging technologies such as social media and various applications on smartphones or tablets can be used as innovative learning media.

Digital disruption provides many challenges including updating curriculum and upskilling staff [11]. Higher education institutions can adopt a supra-disciplinary approach to facilitate students through practical sessions on digital learning in overcoming real-world sustainability problems [12]. Educators are required to innovate learning continuously to prepare students for the future. Teachers can make learning innovations that lead to learning that utilizes digital technologies.

The perspectives of the three key constitutive elements of digital disruption: digital innovation, digital ecosystems, and value logics. This study focuses on digital innovation in learning, such as the use of the internet as a learning resource, innovative learning media, and online learning systems [10]. Digital innovation is the use of digital technology during the innovation process [13]. Through digital technology, it will not only change the education content and the student experience but also influence student attraction and student retention. Not only is the use of the internet as a source of learning increasing but also online learning systems or learning based on collaborative platforms, such as MOOC, Edmodo, Moodle, Ruang Guru which have been implemented in Indonesia and other countries.

There are few disruptive digital technologies poised to disrupt higher learning: Augmented Reality (AR), Virtual Reality (VR), Collaboration Platforms, and Artificial Intelligence (AI). Sungkur [14], AR is a technology that has the potential to encourage learners to explore learning materials from a new perspective.

The use of AR technology in learning can involve students in the learning process that could develop their

knowledge and skills in terms of Information, Communications and Technology (ICT) literacy [15]. Even a study by Kabtane, et al. [16] found that the use of AR-based approach in the Massive Open Online Course (MOOC) has results that the level of understanding and satisfaction of participants using the AR based approach in the MOOC is higher than those who do not use it. Based on these facts, digital innovation in learning is a challenge for teachers to be able to compete in the current era of globalization. Digital innovation through the application of new technologies in learning can help to bridge the gap between education and employment by connecting students with businesses that may want to hire them.

### 2.2. Theory of Perception

This study uses perception theory to explore student perceptions of digital disruption in learning. There is nothing else accessible to us except perceptions because what we perceive are only perceptions [17]. The process of perception begins with an object that gives rise to a stimulus, then the stimulus hits the sensory organs. Perception is an important psychological aspect of humans in responding to the presence of various symptoms and aspects in their environment. However, what humans feel can be very different from objective reality.

Fundamental to perception by Lewis [18] is that there is an experiencing person or perceiver; something is being perceived (either an object, person, situation or relationship); there is the context of the situation in which objects, events or persons are perceived, and finally there is the process nature of perception starting with the experiencing of multiple stimuli by the senses and ending with the formation of perceptions.

Perception is a process by which individuals organize and interpret their sensory impressions to give meaning to their environment [19]. When we look at a target and attempt to interpret what we see, our interpretation can be influenced by our characteristics. Perception is the term of a person maintaining a relationship with the environment in the internal state [20]. Several internal and external factors shape and sometimes distort perception.

Three factors that influence individual perception: perceiver factors, situation factors, and target factors [19]. Factors in the perceiver are attitudes, motivates, interest, experience, and expectations, while time, work setting, and social setting are in the situation factors. Factors in the target are novelty, motion, sounds, size, background, proximity, and similarity. This study explores students' perceptions of digital disruption in learning from factors of interest, experience, expectations, time, social settings, and novelty.

The perceiver factors were chosen to explore students' interests, experiences, and expectations for digital innovation in learning. Are students interested? So, what are their experiences when participating in digital learning? And what are their expectations for digital learning in the future? Robbins and Judge [19] see the interests, experiences, and expectations of the perceiver as influencing that which is perceived. The situation factors are used to explore their time and their environment in supporting the implementation of digital learning innovations. As exemplified by Westra [21] that to support quality online courses, the administration understands the need for faculty development. It means that the application of digital learning certainly has the support of the institution.

The novelty in the target factor means that a new stimulus will attract our attention more than something we already know. Whether digital innovation in learning can attract student attention beyond the knowledge they have previously obtained. Found that perceived novelty is a salient affective belief that plays a significant role in the adoption of IT innovations [22]. Novelty is often defined as the degree of contrast between present perception and experience.

### 3. METHODS

This phenomenological study describes students' perceptions of digital disruptive in learning. Phenomenology as a philosophy provides a theoretical guideline to understanding phenomena at the level of subjective reality [23]. The informant was ten students in the Accounting Department, Universitas Negeri Malang (UM). Ten students as informants in this study consisted of four students from 2018, three students from 2017, and three students from 2016.

The first step taken in the data coding process is to prepare the interview data to be verbatim. Each participant was coded as a marker for the names of subjects, i.e. AL, SH, ZT, NH, IT, MD, KL, PU, ND, and RH. Then, the results of the exposure from participants were coded according to the types of questions that had been prepared by the research team.

After that, compaction of the facts as well as interpretation of the data. Researchers reconstruct participant sentences into well-organized sentences and can make it easier for researchers to understand the meaning of participant's speech. After the process of compaction of facts and interpretation, the next step is to categorize the data. Choose the main needs, namely the categorization of what is most important to answer the research problem.

In 2018, UM has implemented a new online learning system, SIPEJAR. SIPEJAR is a renewal system of e-learning that has been implemented before at UM. The

features in SIPEJAR are completer and more following curriculum development at UM. Accounting Department Faculty of Economics UM facilitates wifi in every class and outside the classroom, so students can use it to search for learning resources via the internet. Lecturers in the Accounting Department have used AR technology in learning Accounting Information Systems. Based on these conditions, this study uses purposive sampling. Purposive sampling is generally used in phenomenological research. The determination of the sample based on criteria: (1) students who have taken lectures for at least 1 year; (2) students who have participated in learning using AR technology; and (3) students who have used SIPEJAR in learning [24].

This study uses the stages of data analysis by (Miles, M. B., Huberman, A. M., & Saldana, 2014). The stages are data collection, data display, data consideration or data reduction, and conclusion drawing. Data collection methods Miles et al. [25] are observation and interviews with ten students, then present the results of the recording of the interviews and observing during the interview. In-depth interviews were conducted concerning the topic of digital innovation in learning, how students' perceptions of learning resource search media, use of learning media, and online learning systems.

The next step is to reduce the data that is not appropriate or deviates from the topic. The analytic process works to reduce the volume of information because qualitative research can produce large amounts of data [26]. Data reduction process can be done by identifying major patterns and themes within and researches can engage this process on their own. The final step is to draw conclusions based on the results of the data analysis process.

### 4. FINDINGS AND DISCUSSION

The perception of digital disruption in this study was seen from the emergence of technological changes used in learning at UM. The results of this study found that students have a positive perception of the use of digital technology in learning. The following is the exposure of data from interviews to students in terms of three factors that affect individual perceptions:

#### 4.1. *The perceiver factors*

All students interviewed have experience using SIPEJAR in lectures, although not in all courses. SIPEJAR is the latest online learning system implemented by UM starting in 2018. Students are enthusiastic when using SIPEJAR. In their opinion, SIPEJAR is a flexible learning system, can be accessed anywhere and anytime. They also hope that future learning is needed online learning systems, but they also don't want online learning to be done continuously. They

still want offline learning because they can still interact with the teacher directly. NH said:

*".....here, sometimes when instructed by lecturers to study online. Yeah..... we open it but not as focused when given information or instructed by the lecturer directly. Sometimes, when we are studying online and at the same time we get a notification on our social media, then surely we will be interested to open the notification, like that....."*

The use of online learning systems certainly involves students in accessing the internet. The internet is also used by students as a source learning and they are also interested in the internet. Their interest is caused by the internet can be accessed through mobile phones and they can do it anywhere so that according to them the use of the internet as a source of learning is more effective and efficient compared to learning without using the internet that they had felt when they studied at the previous levels. It happens because not all students at the high school or previous level used the internet during learning.

They have expectations that the use of the internet as a source of learning will continue in the future and that there is still a need for direction from lecturers on how to use the internet wisely in learning. As stated by ZT below:

*".....so, it remains in the direction.....it remains in the portion she/he (the student) does by himself independently in her/his way but it remains in the direction of the lecturer and the guidance of the lecturer. It means there is a process of justification and clarification afterward....."*

This is slightly different from the use of AR technology in learning, not all students are familiar with even using AR technology directly. Three of the ten students have used it. In their perceptions, lecturers in the Accounting Department have started to do digital innovations in the learning process, even though they are still applied to one course. They are so interested and enthusiastic when studying because they can get to know new technologies that are currently being widely used. They also feel happy to be able to keep up with time. The use of AR technology also increases their learning motivation, so they more easily understand the learning material.

Students who have or have never used AR technology, both expect in the future that current and future learning must continue to adjust to technological developments. ND as a student who has used AR technology stated:

*"AR application makes the learning process more fun and not boring"*

While AH as a student who has never used AR technology in learning stated:

*".....if we use new technology, our IT knowledge can get better..... it means we get used to it in the future because we will not be able to avoid technology. So, we will not experience culture shock....."*

Student perceptions when viewed from the perceiver factor in this study are in line with the results of the study by Popovici and Mironov [27], students have a positive perception of technology. How technology can improve their learning experience and make them more motivating and efficient. While students' perceptions from the results of [28], students also liked to be used digital technologies in their formal education and did not feel anxious or hesitant about such use. They believed that digital technologies would be easy to use and would increase their productivity, enhance their organization for learning, and provide enjoyment.

The perceiver factors are indeed more dominated by internal factors. Hagerstrom [29], interpersonal influences are cognitions concerning the behaviors, beliefs, or attitudes of others, where the cognition may or may not correspond with reality.

#### **4.2. The situation factors**

Situation factors in this study are reviewed from time or student's habit in using digital technology and the support of the surrounding environment. UM strongly supports the implementation of digital learning innovation. Lecturers are given flexibility in applying new technologies in learning. This is also supported by the Faculty of Economics and the accounting department as the education organizing unit. Faculty of Economics has tried to facilitate the availability of internet networks both inside and outside the classroom.

From the interview results, it was found that students have a positive perception of the university's efforts and habit of using technology. Not all students are accustomed to using technology. As experienced by one of 10 students, obtained the fact that he is not familiar and still needs to adapt to using the internet. Informant "IT" stated:

*".....So, here I am very different from my previous environment. Sometimes when I'm online, I still do not know the ways.....I still need to adapt....."*

Furthermore, students see that there are still problems related to technical implementation, especially in the inability to reach the internet network in certain places. As stated by SH below:

*".....but if for the network sometimes it still stagnates, like that....."*

Related to work settings, the application of technology such as the application of online learning systems, the use of the internet, and the use of AR technology at the Faculty of Economics UM certainly cannot be separated from the technical use. In a situation

factor, students have perceptions that digital learning still has weaknesses, such as the results of the study by [30] found that students felt uncertain about the technical appliances in the e-learning portal. That is more related to the functionality and effectiveness of the technical appliance. While the results of research by Smart, et al. [31] found that the largest dissatisfaction factor of students when participating in online learning is the time needed to complete the online module.

### **4.3. The target factors**

The novelty in the target factor is related to students' perceptions of the uniqueness of digital innovation. Students in the Accounting Department have a positive perception of the uniqueness of technology. The uniqueness is interpreted by students more to the characteristics of the technology. For example, are SIPEJAR and AR technology. Students view SIPEJAR as a learning system typical of UM because they are designed by UM and applied only at UM. The concept of SIPEJAR is also adjusted to the curriculum at UM "life-based curriculum". While AR technology is seen by students as a new technology that is being intensively applied in learning, which is very closely related to the daily activities of students. PU said that:

*"In my opinion, the AR application has great benefits for students. Sometimes mobile phones are considered as a nuisance in learning activities, but with this AR application with a storage capacity that is not too large, it makes us able to use mobile phones as a learning medium that is easily accepted in the millennial generation."*

AR technology application is easy to use, can be used to study anytime and anywhere because there is no need to carry heavy books and can be operated via mobile phones. Besides, other participants said that the AR application can add more benefits from the use of mobile phones, not only used for communication on social media but can also be used as learning media.

The research by Mustaqim [32] also founded that the use of AR can directly provide learning wherever and whenever learners want to use it. Besides making it easier for students to access or use it, the result of research by [33] found that AR technology can fulfill the need of student's cognitive, affective, and skills. It means that the use of AR technology in learning is not only easy to use but also beneficial for the development of student competencies.

## **5. CONCLUSION**

The development of digital-based education platforms began to develop in Indonesia. The learning system in the modern era is more effective in providing learning to students. To fulfill the needs of the current

generation interacting with various kinds of social media, the learning process must adjust to current technological developments as well. This is as said by Larkin [34] in his research, mimicking social media aligns learning and engagement technology with the expectations and working practices of the millennial generation.

Digital disruption in learning is characterized by digital innovation or changes in the use of technology in learning. If before even now there are still many who still use learning media limited to the Power Point, so now many emerging new technologies can be applied in learning. One of them is AR technology that has been applied in the Accounting Department of the Economics Faculty.

The application of online learning system (SIPEJAR), the use of the internet as a source of learning, and the use of AR technology received positive responses from students, in the sense that students were interested and expected to continue to be applied by adjusting the latest technological developments. Students sometimes feel bored with online learning (SIPEJAR), because students still want to learn to be carried out alternately with offline learning. However, this does not mean they refuse the implementation of an online learning system.

We need to remember that all of that needs support and commitment from the environment, in this case, the university as a place to provide education services. It means that none of this will work effectively if there are no facilities or services in the student learning environment. As Stoeklen et al. [35] said in his research that the successful implementation of digital learning is largely due to the ongoing commitment to data collection and evaluation at the University and has ensured that the digital learning environment stays modern and adaptive.

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