

The Impact of Disruptive Technologies on Higher Education in Indonesia

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Abstract:

This paper will analyze the extent of predictions to what extent the disruption predicted by Christensen has influenced the dynamics of universities in Indonesia and whether we have readiness in facing the disruption era, and what strategies need to be taken so that universities can survive and carry out their role as critical educational institutions in National development. The method used in this study is to study literature and collect quantitative data from various official sources, including official reports from the Indonesian Ministry of Research and Technology and Higher Education and then process the data. The study results show that disruptive technology negatively impacts learning institutions closely related to specific professions. However, the impact not so much shown in general.

Keywords: technology, the disruption era, education, government

Introduction

Clayton Christensen first coined the term disruptive technology in 1995 in the Harvard Business Review journal (Bower & Christensen, 1995). Christensen states: "No matter the industry, a corporation consists of business units with finite life spans: the technological and market bases of any business will eventually disappear." Later this term became very well known, and Christensen used it in some of his works, such as *The Innovator's Dilemma* in 2014 (Christensen, 1997). In his book *The Innovative University* (Christensen & Eyring, 2011), Christensen also predicted that this disruptive impact would affect the world of higher education. The conventional education model will slowly be abandoned, and people will turn to online learning. He predicts that by 2029, half of the 4000 higher learning institutions in the United States will go bankrupt and close. (Kitcharern, 2019) This is caused by disruption due to online learning technology and the Massive Online Open Courses (MOOC'S). In addition to these impacts, 65% of students will get a job that does not yet exist when they study in college. For example, in an accounting firm, students who are studying in an accounting study program will face new software tools and technologies that they might not have found in college (Brown-Liburd & Vasarhelyi, 2015). This means that new types of work are growing very fast without being accompanied by changes in curriculum in learning institutions. Around 42% of current jobs will be replaced by Artificial Intelligence technology in 2022. All the effects of this disruption will affect universities, including in Indonesia. Richard and Daniel Susskind, in their book, also predicted that this explosion of information technology would also affect the way humans learn. The shifting from conventional education to online learning is inevitable (Susskind & Susskind, 2015).

So far, there are no actual data available and sufficient studies on the effects of disruption on higher education institutions in Indonesia that show the integrity and accuracy of Christensen's predictions has also occurred in Indonesia. The closure of study programs or learning institutions in Indonesia was caused by several factors, namely: unable to fulfil the minimum requirements for study program accreditation, the decline of enrollment, and illegal higher learning institutions. The effect of disruptive information technology in particular on the closure of a study program has not been much studied. This paper is a preliminary study to see the impact of disruption on higher learning institutions in Indonesia. In short, did Christensen's prediction in 2014 also impact universities or study programs in Indonesia?

This research aims to observe the impact of disruptive technology on higher educational institutions in Indonesia and anticipate the negative consequences of disruptive technologies.

Research Method

Data obtained from the Center for Data and Information on Science, "Higher Education Statistical Year Book 2018" is analyzed to receive an overview of: first, is there any impact on the development of information technology on the number of universities or study programs in Indonesia? Second, does it also have any effect on the number of national college applicants? Third, from several universities in Indonesia that have conducted distance education, does it influence new students? The method used in this study is to study literature and collect quantitative data from various official sources, including official reports from the Indonesian Ministry of Research and Technology and Higher Education and then process the data.

Result and Analysis

Hitherto the Christensen Prediction, despite showing signs, is not fully reaching the corresponding number. In America, according to the Forbes report, in general, there are 25% of educational institutions have been closed, merged, or declared bankrupt. But at the same time, there will be 200 universities that will undoubtedly survive while the rest will find a way to overcome this disruption problem (Horn, 2018). Disruptive technology has indeed had an impact on learning institutions in America. Since 2010 students choosing online education have continued to increase to 20% and continue to rise each year. Roughly 10% of students in 2003 took one online course, and it grew to 25% in 2008, up to 30% in 2009 and expected to increase to 50% in 2014 (Allen & Seaman, 2010). But a sizable cause for the closure of this study program is the inability of the institution to finance its enormous operational costs (Horn, 2018).

Not yet fully known how many Higher Education Study Programs in Indonesia were closed due to the era of disruption of information technology. However, some closed study programs were caused by other things such as reduced interest due to changes in employment needs and administrative matters. Referring to cases of study program closure in the United States, study programs that are affected more are those that offer efficient disciplines and offer particular expertise. Disruption is a less negative impact on study

programs that provide basic sciences. This can be understood because study programs closely related to information technology are required to adapt to changes in information technology that are too fast.

In Indonesia, study programs that have been reported have been closed, for example, secretarial study programs at 58 Private Universities, banking study programs at 90 Private Universities, and study tour travel programs at 35 Private Universities. The closure of this study program is due to the lack of interested people in these disciplines in the surrounding area. However, no studies show whether the lack of interest is mainly due to the influence of the emergence of information technology or other things (Supingah, 2020). The closure of the study program was an old phenomenon before the era of disruptive technology. For example, during 2007, there were 113 study programs from 64 private universities (PTS) in West Java that were closed, 20% of 244 private universities in Central Java collapsed during 2009 due to financial difficulties and were unable to compete with financially strong state universities, and only 20% of private universities can compete (Soegoto, 2014). Therefore it cannot be ensured that the emergence of online learning causes the closure of several study programs in Indonesia.

Although some study programs were closed due to a lack of interest in some discipline areas, on the contrary, official data released by the Ministry of Research, Technology and Higher Education from 2012 to 2018 show different results. Instead, there is an increase in the Gross Enrollment Ratio (GER), new students, and the number of study programs offered at both public and private learning institutions. Statistical data shows that from 2012 to 2018, the number of higher learning institutions even tend to increase slightly from 3189 in 2012/2013 to 3293 in 2017/2018, as shown in Figure 1 below (Ministry of Research & Education, 2018).

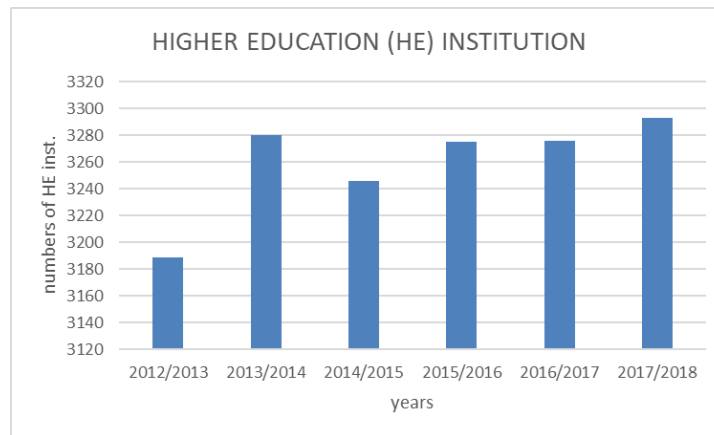


Figure 1. Number of Higher Education Institutions in Indonesia from 2012-2018

The number of new students and students enrolled from 2012/2013 to 2017/2018 also tends not to be affected by the emergence of online learning media and the administration of distance education. Instead, it has increased, as shown in Figure 2.

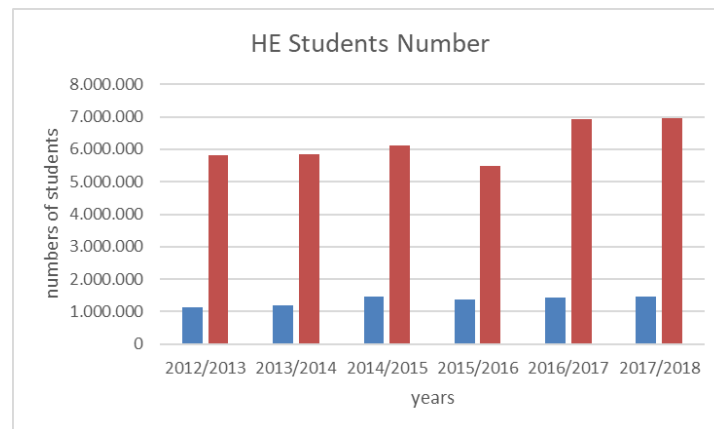


Figure 2. Number of New Students (Left) and Registered Students (Right) Every Year From 2012-2018

Whereas the Gross Enrollment Ratio (GER), which compares the number of undergraduate students (diploma and bachelor) with the population aged 19-23 years, actually experienced growth, as shown in Figure 3 below.

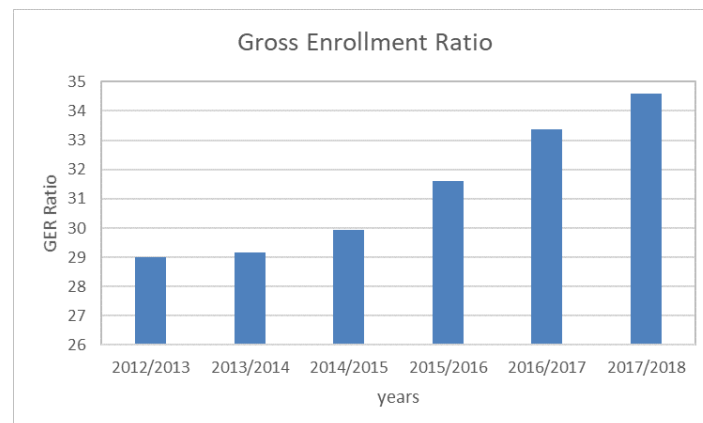


Figure 3. Gross Enrollment Ratio (GER) from 2012-2018

From the three graphs above, it can be seen that there is no significant effect of disruptive technology on the number of higher education enthusiasts in Indonesia as predicted by Christensen in the United States. This is indicated by the number of new students enrolled in public and private universities, which tends to be stable or even slightly increased. Likewise, the participation rate of young people continues to grow over the years, and the growth of study programs has also increased, albeit slightly.

Until now, there are more than 15 public and private universities that have held distance education, namely: Bina Nusantara University, Amikom University, Surabaya State Electronics Polytechnic (PENS), Mercu Buana University, Pelita Harapan University, University of Indonesia, Bogor Agricultural University, Sumatra Institute of Technology, Yogyakarta State University, Semarang State University, Makassar State University, Malang State University, Ganesha Education University, Madiun State Polytechnic, and Bandung State Polytechnic. Telkom University, YARSI University. The Ministry of Research and Technology has also launched the Indonesian Online Learning System (SPADA) to provide opportunities for Indonesians to get education remotely without having to register with an official educational institution. The emergence of many distance education providers and various online learning platforms does not have a negative impact but rather complements conventional learning.

Regarding the impact of disruptive technology on the suitability of work with the field of study taken by students to date, the Ministry of Research, Technology and Higher Education (RISTEKDIKTI) does not yet have complete data. Still, efforts to build a database centre have been carried out centrally through the website <http://pkts.belmawa.ristekdikti.go.id/>; because of that, until now it has not been able to conclude in full whether disruptive technology has significantly influenced the world of work or not.

Conclusion

Disruptive technology can explore the negative impact on learning institutions, especially those closely related to professions that are very specific and related to information technology. This needs to be anticipated through a more flexible curriculum design. But Christensen's prediction seems to date not generally felt by higher learning institutions. The phenomenon of closing study programs is caused by the effects of disruptive technology and other factors such as financial management. On the other hand, disruptive technology should be used to increase the Gross Enrollment Ratio (GER). The increase in student participation in online learning does not necessarily mean a decrease in students taking conventional courses. Instead, it provides opportunities for people who have been unable to participate in formal and traditional education. More detailed and complete data is needed to anticipate the disruptive effects of technology in Indonesian higher learning institutions.

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