

EDUTECH: A SOLUTION AND CHALLENGE OF INDONESIAN EDUCATION IN THE ERA OF THE INDUSTRIAL REVOLUTION 4.0. AND SOCIETY 5.0

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Abstract

Indonesia is entering the era of the industrial revolution 4.0 and Society 5.0. In the world of education, for example, significantly higher education, this has been done through education technology or termed edutech. During the covid-19 pandemic, almost all educational activities finally chose to use edutech because they had to adapt to the conditions that engulfed people worldwide. This research was conducted by examining library materials or secondary data, known as library research. In order to get answers or solutions to the problems formulated in this research, the approach used is positivism, interpretive and critical approaches. The nature of the research used in this research is descriptive-prescriptive and uses content analysis. The results of this study examine how the advantages and disadvantages can be elaborated so that it brings many good things that can improve the education system in Indonesia. Although edutech has weaknesses and shortcomings, proper management can minimize the adverse effects. It also depends on the educational institution that uses technology and the synergy of the students. It is necessary to create a good balance between the use of technology and real-world experience to minimize the adverse effects of edutech.

Keywords: Edutech; Solution and Challenge; Industrial Revolution 4.0; Society 5.0; Indonesia.

1 INTRODUCTION

Sustainable growth with collaboration between universities, industry, and the government to become a system that strengthens each other and the engine of the nation's growth. Universities are no longer stand-alone but producers of knowledge and innovation and centers of excellence. Then the results can be collaborated with industry needs and developed together. Creating a unique, collaborative, competitive academic culture in higher education is essential to Indonesia's human development. Universities also have the task of developing human resources who can reason critically, actively, innovatively, with national insight, and an entrepreneurial mindset. Lecturers are also the driving force as an inspiration, partner, friend, and teacher for students to distribute learning-based outcome curriculum.

The general education system has remained the same for hundreds of years. However, the influence of technology can change everything quickly, especially in the era of the industrial revolution 4.0 and society 5.0. This collaboration between education and technology is referred to as Education Technology or better known as Edutech.(Najdawi & Stanley, 2021) In the era of the COVID-19 pandemic, everyone is forced to keep their distance and avoid crowds. Therefore, any activities outside the home that require large crowds have been stopped, including university teaching and

learning activities. Teaching and learning activities in universities are then transformed into online forms using several long-distance communication technologies with the edutech concept. This is done so that the teaching staff can organize teaching and learning activities without the need to face to face with students. The role of edutech is enormous here as a solution during emergency conditions such as the COVID-19 pandemic that is hitting and dealing with world developments in the era of the industrial revolution 4.0 and society 5.0.(Wibowo, 2021).

The edutech sector is experiencing an upward trend in Indonesia. A population of 55 million people also drives this. Today's students have started to be literate with technology. Moreover, the COVID-19 pandemic forces everyone to keep their distance and avoid crowds. Thus, teaching and learning activities are transformed online using several distance communication technologies.(Sevima, 2022) Inevitably, students are closer to using computers, laptops, or gadgets. So it is not surprising that users' access to the internet is increasing day by day. Indonesia's internet users reach 74% of the total population. So naturally, this is an excellent opportunity for the edutech sector.(Xendit, 2022).

2 METHODOLOGY

Research is essentially an activity that seeks the truth of science, where research is born from doubts or curiosity about a problem.(Fernando, Utami, et al., 2021) Edutech writing: a solution and challenge of Indonesian education in the era of the industrial revolution 4.0. Moreover, society 5.0 is carried out by researching library materials or secondary data, which can be called normative research or library research, which is carried out by collecting primary, secondary, and tertiary legal materials.(Fernando, Pratiwi, et al., 2021) In this study, an analysis will be made using several approaches, namely: the concept approach, analytical approach, historical approach, and futuristic approach, using descriptive and prescriptive properties.(Fernando, 2020a) After that, the materials that have been collected will be processed along with an analysis that strengthens the results of this study.(Bambang Waluyo, 1991) This study uses content analysis.(Fernando, 2020).

3 FINDINGS AND DISCUSSION

3.1 Edutech: A New Style Education System in The Era of Revolution 4.0 and Society 5.0

The COVID-19 pandemic has brought significant changes in all sectors of human life. This pandemic has hardest hit the tourism sector. However, other sectors are no exception. On the other hand, several sectors are taking advantage of this condition as an opportunity to grow and develop various life-supporting innovations. One is the education sector, where technology is developed as a digital learning solution.(Kompasiana, 2022)

Edutech is a combination of two words, namely education and technology. Edutech is a modern education system that refers to the use of hardware and software designed to improve classroom learning activities and educational outcomes in the era of the industrial revolution 4.0 and society 5.0. Edutech is still in its early stages of development but has shown promise as a method of adapting curriculum to student proficiency levels by introducing and reinforcing new content at a pace that students can handle.(Cen et al., 2020) In addition to the educational experience, edutech or educational technology is based on theoretical knowledge from various disciplines such as communication, education, psychology, sociology, artificial intelligence, and computer science.(Sevima, 2022)

Edutech can be a controversial topic. Since most education systems are highly systematic, there is concern that edutech is an attempt to eliminate specific class assignments to reduce budgets. The creators of edutech emphasize the potential for improving software and technology, thereby helping lecturers' performance as formal teaching staff. With time constraints, it is difficult for a lecturer to teach according to the curriculum, catch up with lower-level students, and keep the upper class engaged in their work. By automating ability assessments and adjusting the difficulty of teaching and learning activities, edutech can provide better results for individual students and the class as a whole in the era of the industrial revolution 4.0 and society 5.0.(Rassolkin et al., 2020)

The Open University became a pioneer in Indonesia in conducting distance education through the edutech mechanism before it was popular as it is now. Edutech has even become a way where education can reach anyone and anywhere without having to meet face to face. Despite the uneven distribution of development, especially in educational infrastructure and Indonesia's geographical conditions, edutech can be developed to overcome existing problems. In addition, during the covid-19 pandemic, almost all educational activities finally chose to use edutech because they had to adapt to the conditions that were engulfing people worldwide. However, edutech is also not

without gaps. Many challenges and things must be studied, such as whether the continuous application of edutech will have a good effect on students, because it is feared that social interaction with edutech will decrease, lazy human behavior and many other effects domino for the application of this edutech.

There are two ways of implementing technology in the classroom. The first is the introduction of hardware into the classroom. Second, teaching and learning activities rely more on software capabilities so that coordination in the classroom can be better and utilize all available hardware. The use of the software is one example of edutech. Much of the software is cloud-based and is used in educational research to establish basic algorithms for how slowly or fast to advance student competence across different teaching and learning activities.

Types of edutech (Education Technology) that exist and develop in Indonesia: (Ibnu, 2021)

a E-Learning;

The first type of edutech is e-learning. E-learning is a platform that can present learning materials online or online with various interactive content, live tutoring, and video on demand. For Indonesia, including being used by the Open University, this service is also the most widely used by the general public. Apart from a large number of e-learning startup companies in Indonesia, it turns out that this type of platform has also been around for a long time, starting with Zenius in 2004.

b Learning Management System (LMS);

The next type of edutech is a learning management system. LMS can assist teachers in planning their learning activities. Such a system can be used by institutions, individuals, and several universities in Indonesia.

c Software as a Services (SaaS);

In addition to the two types above, there is also a type of edutech that provides software provision services or what is familiarly called SaaS. Generally, many SaaS targets elementary, junior high, and high school levels by digitizing business processes, such as administration, attendance, etc. They will generally work with conventional educational institutions or institutions that want to change the digital world.

d Massive Open Online Course (MOOC)

MOOC is a distance teaching method with a larger scale scope, accessible and can be accessed by anyone, anywhere, and anytime. This type of edutech will later provide various university-level courses to obtain certification from various well-known universities in Indonesia. There are many edutech startups of this type, such as Udacity, Coursera, edx, Duolingo, and Khan Academy.

In Indonesia itself, edutech is starting to develop. Sourced from Daily Social, the development of edutech startups began to be seen around the 2015s. This development is accompanied by equal access to information technology in all corners of Indonesia. In addition, the Pre-Employment Card also opens the view that education does not have to be carried out face-to-face. With the proper methods and systems, access to technology-based education can help improve the quality of education in Indonesia. Quoting from Liputan 6, there are around 44 edtech in Indonesia that is still operating today. This amount is also accompanied by a significant level of funding for each of these startups. This is certainly a good signal for the development of educational technology, both in terms of business and job opportunities.(Perdana, 2020).

Remote teaching and learning activities through the edutech mechanism are indeed more fun to do. Packed with modern technology, classroom learning which used to be done conventionally, has become a more modern and fun way for students to follow. In addition, learning that uses technology is also beneficial for students and lecturers to interact more easily. This process will help students and lecturers to know the critical role of each. So that enthusiasm for each lesson can feel more fun and interesting to apply. In addition, the learning carried out using Edutech is very effective. Educators and lecturers do not need to spend hours conducting discussions or teaching and learning activities. Teaching and learning activities will be much more effective with existing technology.(Sevima, 2022).

3.2 Edutech as Education Budget Efficiency Effort in Indonesia

Indonesia is heading to its golden age in 2045. As the nation grows, there are also many challenges that the Indonesian nation will face. Thus, adaptation and transformation are needed to prepare the Indonesian people to welcome Indonesia Gold 2045, one of which is the key to education.(Dwi Rustandi, 2020) The traditional education system is inherently inefficient. Worldwide, the education and training industry combined has spent more than US\$4 trillion, representing a significant increase of 84 percent since 2000. Nonetheless, literacy rates in Indonesia remain

stagnant, while it is estimated that around 85 percent of every rupiah is spent as a budget. Education has been spent on building schools and paying for teaching staff.(Bhardwaj, Riaz; Yarrow, Noah; Cali, 2020)

Therefore, the relationship between increased education budgets and educational performance is perceived to be less efficient, and budget reductions related to traditional education delivery are an obvious opportunity for Edutech. This is especially true for conducting e-learning methods, which can deliver one-to-many students on a minimal budget basis. Examples of teaching models or courses through teleconference applications that are currently used, such as Zoom Cloud Meeting and Google Meet.

However, cost efficiency is not only the domain of the e-learning world. Reliable broadband services and other technologies such as the Cloud have facilitated policies such as "bring your device" in schools, allowing students to use their equipment. As a result, less budget is spent providing established hardware for schools.

The dutch-based education system is the most urgent alternative for democratizing education and improving education quality by resolving education polarization in the era of the industrial revolution 4.0 and society 5.0. The importance of Edutech lies not only in its power to lower budgets and engage students in new and innovative ways. It is also all about how it can equalize standards and allow access for all students to achieve democratization in the field of education.(Lee & Choi, 2021)

Online platforms, smartphone applications, and new learning formats have massively increased access to education and improved the teaching and learning process. In contrast, online and cloud technologies have presented attractive standardization possibilities for learning content. Now, every campus in the area can receive the same standards and levels of learning content as the City area.

By saving on education or training budgets, more money can be allocated to other elements of education, such as learning apps that provide customizable lesson plans or innovative digital content such as engaging video materials that will enhance student competence. Multi-media degradation, gamification, informal learning, and peer-to-peer learning make educational content more immersive, so edutech is designed to attract students and keep them engaged until the activity ends.

Edutech also creates stronger connections between what happens in the classroom and what goes on outside the classroom (at home, on the go, and so on), making lecturer-supported digital educational resources available around the clock, such as assignments and exam preparation materials, to create a structured circuit in the student learning experience. Edutech is also changing how students consume education in the same way that Cloud technology has changed how we consume music and television. With minimal risk, it can be said that the successful development of these tools will impact every aspect of our future. Accessible and effective solutions for excellence in classroom education can empower students and faculty to focus more on learning tasks. They can do more with the instructional technology at their disposal, improve the learning process and the overall quality of education available to young people worldwide, equipping them with better facilities for the future. With increasingly sophisticated edutech tools, teachers can better manage the curriculum and facilitate student engagement in the classroom. It all aims to prepare and produce successful academic graduates by providing them with all the instructional materials needed to excel outside the classroom. We must ensure they have quality educational facilities to build a brighter future for all living beings on this earth. The next generation will face many unexpected challenges, so the current generation must ensure they do not lack the support to overcome them. For example, the video learning format has been proven to accelerate the learning process and is an attractive format for students.

3.3 Obstacles in Implementing Edutech (Indonesia)

Indonesia Gold 2045 is the government's vision to build a developed country that is sovereign, just, and prosperous. With superior Human Resources and mastering knowledge and technology, Indonesia will be known as one of the world's economic powers. Right at the age of the 100th Republic of Indonesia, Indonesia is expected to have national resilience as well as a stable and authoritative government. However, it is still miserable that this excellent vision is still in the form of an opinion where there is no real work or work to prove the existence of a golden Indonesia in 2045. The extensive homework in realizing this dream is the youth, as the next generation and nation. Even today's conditions are very worrying, where young people are mostly just busy with their respective smartphones and trapped in their individualistic nature that has been firmly entrenched in their minds. The future generation of Indonesia, or the golden generation of 2045, is the main foundation to build the Indonesian nation into a great, advanced, glorious, and dignified nation. Those who have good character and integrity as an Indonesian nation and are competent in their fields, those who quickly adapt to changes and can use advances in digital technology, are

the golden generation of 2045. Therefore, education plays a vital role in saving and preparing the next generation of the nation that will later continue the milestone of Indonesia's leadership.(Wartaguru, 2022)

Currently, in Indonesia itself, edutech has begun to develop rapidly. Even based on the results of research by the Indonesian government in 2021, the number of education technology in Indonesia has reached around 210 edutech startups. This means that the existence of this edutech is in great demand by the people in Indonesia and certainly has a positive impact on the development of education in the country. Various edutech platforms in the country utilize this media to present various learning materials, campus academic systems, and other educational needs.(Sevima, 2022)

However, behind that, many obstacles occur in the Edutech system if we look further into the future, where all courses have the potential to be managed by software. Today, many people use analytics to assess student competencies across various curriculum sectors, enabling students to progress more quickly in some areas while spending more time strengthening their weaknesses. When each student works on the customized curriculum, the lecturer acts as a facilitator and problem solver with the insights that have been provided by edutech-based software to be able to see how much the student's strengths and weaknesses are.

In practice, edutech is still in the early stages of development. There are various design challenges for edutech. The biggest hurdle is adapting to the different learning styles in each class. Currently, edutech is usually delivered via a laptop or tablet, so it is expected to produce a maximum learning experience. Critics have noted that this learning style can put students with hearing and kinesthetic impairments, for example, at a disadvantage. As with other areas of new technology development, edutech will be used more and more and more feedback will be obtained.

However, edutech will face other social obstacles. The community hopes lecturers create a social environment that allows group learning and other dynamics not currently within the scope of edutech. The future classrooms may rely heavily on edutech to do the heavy lifting, but many educators still see value in a group set apart from purely academic goals.

Some obstacles that occur, of course, must always be faced and overcome in various ways. However, the obstacles that occur to students are not far from signal problems or inadequate internet networks in some areas because not all places have smooth internet conditions. This sometimes prevents students from understanding the material delivered by lecturers because of the

signal constraints, such as when doing online learning. However, suddenly the lecturer's voice is cut off, or even the application stops when the lecturer is teaching.

Although edutech has its weaknesses and shortcomings, proper management can minimize the adverse effects that arise. It also depends on the educational institution that uses technology and the synergy of the students. It is necessary to create a good balance between the use of technology and real-world experience so that the adverse effects of edutech can be minimized. Offline activities are not eliminated. They even need to be structured as a form of collaboration and an excellent strategy to create skilled students who can compete professionally as the goals of Indonesia's sustainable development goals (SDGs) in 2030 and Indonesia gold in 2045.

4 CONCLUSION

Edutech is a modern education system that refers to the use of hardware and software designed to improve classroom learning activities and educational outcomes in the era of the industrial revolution 4.0 and society 5.0. Edutech has the potential to provide better results for individual students and the class as a whole in the era of the industrial revolution 4.0 and society 5.0 in Indonesia. Indonesia will reach its golden age in 2045. As the nation grows, there will be many challenges that the Indonesian nation will face. Thus, there is a need for adaptation and transformation in preparing Indonesian people to welcome Indonesia Gold 2045, one of which is with the key to Education through edutech, which will save the education budget, and the existing budget can also be used for other needs to strengthen the education sector. Obstacles that occur in the edutech system if we look further into the future where all courses have the potential to be managed by software. In practice, edutech is still in the early stages of development. There are various design challenges for edutech. The biggest hurdle is adapting to the different learning styles in each class. Edutech will face another social obstacle. The community hopes lecturers create a social environment that allows group learning and other dynamics not currently within the scope of edutech. Not to mention technical obstacles such as inadequate signal or internet network in some areas because not all places have smooth internet conditions. Although edutech has its weaknesses and shortcomings, proper management can minimize the adverse effects that arise. It also depends on the educational institution that uses technology and the synergy of the students. It is necessary to create a good balance between the use of technology and real-world experience so that the adverse effects of edutech can be minimized. Offline activities are not eliminated. They even need to be structured as a form of collaboration and an excellent strategy to create skilled

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