

# The Challenge of Education in Pandemic, Internet and Income in Indonesia

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**Abstract :** This study aims to understand the behavior of data from education, internet users, and per capita income of the Indonesian people before the COVID-19 pandemic (Before 2020). We use the annual research period from 2000 to 2019 to understand the behavior of data from education, internet users, and people's per capita income so that we can understand the possibilities that will occur in the future with economic shocks that have an impact on education and the economy, namely the covid 19 pandemic. For this purpose, the Threshold Autoregression model is used. We found that data behavior of Investment in education and technology in the pre-pandemic period can be seen very well in boosting the per capita income of people in Indonesia. This means that the online education system can be a practical solution in increasing the human capital of the Indonesian population through an online education system so that it can increase Indonesian human capital that can be used in economic development or production activities in Indonesia so that it can encourage people's income which in aggregate can encourage economic growth which means, the Indonesian economy has the opportunity to recover and grow by encouraging the improvement of online education services.

**Keywords:** Human Capital, Internet, Gross Domestic Product Per Capita

**JEL Classification :** C01,E24,J24, J43

## 1 INTRODUCTION

The Covid-19 pandemic has provided an overview of the continuity of the world of education in the future through the help of technology. However, technology still cannot replace the role of teachers, lecturers, and learning interactions between students and teachers because education is not only about acquiring knowledge but also about values, cooperation, and competence. This pandemic situation is a challenge for each individual's creativity in using technology to develop the world of education. Currently, the pandemic is a challenge in developing creativity in the use of technology, not only transmitting knowledge but also how to ensure learning is conveyed properly (Munastiwi &, Puryono,2021). The development of Internet technology in everyday life has a tremendously positive impact on various aspects of life, including in the world of education. The education system supported by Internet technology has produced distance learning methods that can be used by teachers and students in schools. Therefore, currently, the Internet has an important role as a means of supporting the development of the quality of education in Indonesia.

The main benefit derived from the use of the Internet in education is as a means of finding information. What's more, the information on the Internet is more up-to-date than books or libraries. It can be said that almost all information about education can be accessed via the internet, such as subject matter, curriculum, syllabus, lesson questions, and how to do it. In addition, the internet also makes it easier for you to find literature references, just by typing keywords according to your needs, then you will immediately get information that matches the literature keywords. In addition, the use of Internet technology that is currently being widely used is the distance education system. This distance education can be found at a number of universities that provide online courses, allowing students to study without having to attend the university. We can also access learning modules remotely without worrying wherever we are. The internet also has an important role for students in seeking scholarships. Through the internet, you can easily access information about scholarships at home and abroad more broadly (Chang et al,2021). Technology is a solution in the midst of conditions full of uncertainty like now. Online learning (on the network) during the pandemic, face-to-face learning in schools is very risky for the transmission of Covid 19. The problem is not only how effective teaching and learning activities can be online, but also adjustments to student conditions at home. During face-to-face learning in schools, students are equalized even though they have different social backgrounds.

This pandemic period can train and instill the habit of becoming independent learners through various online classes or webinars that are attended by students. In addition, students can also work together with each other to solve

problems in learning and face real problems that exist. He also added that this situation is not only a challenge for students, but also for lecturers in delivering education where lecturers need to ensure that students understand the learning material. Online learning is a challenge for the world of education with the situation of Indonesia which has thousands of islands. How technology can be used, how to provide internet access in remote areas where electronic goods without internet access are still a luxury. This is a challenge for all parties, at this time we have to work hard together on how to bring technology to answer real problems that occur to students and students who are less fortunate in terms of economy and technology who are in remote areas.

## 2 LITERATURE REVIEW

In the 21st century now, humans cannot be far away from technology. It is undeniable how technology is able to simplify everything in daily activities. And technology, especially gadgets, definitely requires an internet network as a complementary item so that it can reach everything universally. Not except in the field of education. In line with the times, the advancement of internet technology is also growing rapidly. The internet is a computer network that can connect a computer or computer network with other computer networks so that it can communicate or share data without looking at the type of computer itself. Data year by year the number of computers that have been connected to the internet around the world continues to grow and this number continues to grow every day. Today the number of websites reaches billions, their contents contain various topics. Of course, these sites are a source of information, both positive and negative. Information is said to be positive if it is useful for users and their environment. What are the positive and negative impacts of internet use for student, and what are the solutions in solving internet problems for students (Bai & Zhang,2020).

The existence of the internet has a positive impact on the entire community of internet users, including student in general, especially during school. There they can quickly get information, can search for it using google or in other ways. But most student use the internet to find friends to chat with, send e-mails, and look for college or school assignments. Among today's student, Facebook and Instagram are booming. They find friends through a network of friends and can also send photos or others. Even today, anyone can have a personal website using a weblog that can contain personal information about someone, whether it's a character, artist, celebrity, and so on. More and more communities are using online forums that accommodate users to exchange information or even discuss, users who join are asked to register first before using the facilities provided by the website manager. There is also a positive impact of using the internet for student, getting more advanced, sure, accurate, and fast information. Allows us to communicate remotely, without having to go to the person. Students and students can carry out assignments at school easily and quickly. By accessing the internet we can know more about the world, make it easier to find information and easier to market the products we want to sell. In addition to the positive impact of using the internet, it turns out that there is also a negative impact, which is one of the deviant behaviors committed by students such as crimes committed against someone using internet facilities in cyberspace that are bad and deviant as pornography. With quick and easy access to information via the internet, pornography is rampant. On the internet, there is pornographic and violent content that can lead to an impetus for someone to act criminally. Especially the student in the school period who are still laymen whose curiosity is very high. To reduce this, guidance from adults is needed to control every activity carried out by children, especially supervision from parents (Kalkim & Sert,Z.E. (2021).

In addition, the internet is not free from fraudulent activities. It is best to ignore this or confirm the information you get from the information provider. There are various forms of fraud in cyberspace. Like carding which is a shopping activity by breaking into someone's credit card. Because of its real-time (direct) nature, shopping using a credit card is the most widely used method in the internet world. Internet criminals also commit the most crimes in this field. With an open nature, criminals are able to detect online transactions (which use credit cards) and record the credit card code used. Henceforth they use the data they get for the benefit of their crimes. Another impact of the development of the internet is the spread of online gambling. With the network available, gamblers no longer need to go to a special place to fulfill their desires. Another negative impact of reducing the social nature of humans because they tend to prefer to build communication through social networks rather than meet in person. From the changing social nature, it can lead to changes in people's patterns of interacting. In this modern era, the internet is very easy to find and has been very embedded in people's daily lives. Especially in the world of education where the internet itself is very helpful in completing a job or can be used to find out something you want to find. Internet is an acronym for interconnected

networks. The Internet is a communication system capable of connecting computer networks around the world. Various types of computers with different specifications can communicate with each other via the internet. Several different forms of networks can exchange information and data over the internet using a set of rules called the TCP/IP protocol (Chang & Guo,2021).

The internet is also referred to as a service that makes it easier for us to find materials that are difficult to find and to communicate remotely and add insight. With the development of the internet that is constantly evolving, it tends to greatly affect the world of education, where a student is required to use the internet as an educational support medium used to add knowledge and learning materials. That way students can search for a variety of useful knowledge and information and add insight easily, not only based on what is taught by educators. Students can look for examples of practice questions to test their abilities because the internet has provided various kinds of practice questions. All information is very easily accessible and does not take a long time. The internet has become the main tool in improving the quality of education and developing science and technology. But other than that the internet itself cannot be separated from something that has a bad or negative impact if the use of the internet is used for things that shouldn't be done. Like the spread of pornographic sites that are very common, students become lazy and addicted to the internet, the creativity of students becomes low due to being accustomed to depending on the internet. Especially for students who are very easy to access the internet network (Khodami & Sheibani,2020).

Education is a conscious effort made by adults (educators) to immature people (students) to gain maturity, both physical and social maturity. Conscious effort means that education is carried out with full awareness, planned and systematic, not carelessly, all through a logical, rational, and accountable process. Education exists because of conscious and planned interaction activities, there are at least two people or two parties, namely educators and students. Furthermore, it creates an atmosphere of learning and learning, the existence of values that are believed, students can develop optimally, and activities carried out to achieve maturity, both physically, psychologically, socially, emotionally, economically, morally, and spiritually in students (Beker & Magnuson,2014). Education basically intends to help students to empower their potential or develop their human potential. Therefore, the target of education is human. Education is also interpreted as a very important thing in life. Along with the progress of science and technology today. Which with education can produce educated people in order to develop a developed country. In the world of education, today can not be separated from the internet. Because the internet can really help the learning process if its use is right on target. Like the internet as a communication medium that facilitates the process of communication between others, both with friends, teachers, and parents. Where distance and time are no longer a barrier. With the internet, communication can occur face-to-face without thinking about distance, because of the many developing sites. The use of the internet can not be dammed, let alone will beat Japan in the coming year. Teachers as educators have a leading role in providing teaching, education, and guidance so that the use of the internet is as expected, namely as a learning resource that has no limits on time and distance for every human being.

### 3 RESEARCH OBJECTIVE AND METHODOLOGY

This study aims to understand the behavior of data from education, internet users, and per capita income of the Indonesian people before the COVID-19 pandemic (Before 2020). We use the annual research period from 2000 to 2019 to understand the behavior of data from education, internet users, and people's per capita income so that we can understand the possibilities that will occur in the future with economic shocks that have an impact on education and the economy, namely the covid 19 pandemic. For this purpose, the Threshold Autoregression model is used. In this study we used the autoregressive equation as follows:

$$AR_t = Y_t = c + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \dots + \Phi_p Y_{t-p} + e_t$$

Where AR is Y and Yt is Y from time to time in a time series which is influenced by Yt-1 or Y from time to time in the past in period 1 and Yt-1 itself is also influenced by Yt-2 which is Y in the past in period 2 onwards which is influenced by et which is the error term for the time in the study period. This study focuses on secondary data sourced from world banks, including data on internet users, education and GDP per capita in Indonesia. With the econometric equation as follows:

$$Y_t = \beta_0 + \beta_1 Ed_t + \beta_2 Iu_t + e_t$$

Where Y is gross domestic product per capita, t is a period of time, β is constant, Ed is Education, Iu is internet user, and e is an error term.

From the econometric equation above, it is reduced to the following autoregressive threshold equation:

$$GDP\_PER\_CAPITA = (C(1)*EDUCATION + C(2)*INTERNET\_USER) + (C(3)*EDUCATION + C(4)*INTERNET\_USER)*@LOGIT(C(6)*(GDP\_PER\_CAPITA(-3)-C(7))) + C(5)$$

Where C is a constant. All data are secondary data from world banks with an annual period of 2000 - 2019.

#### 4 RESULTS AND DISCUSSION

In analyzing the threshold variable, the GDP per capita variant is used as an indicator of people's income growth, education as an indicator of educational investment, and internet user. The following are the estimation results that we have done:

$$GDP\_PER\_CAPITA = (-8.73935190194e-08*EDUCATION + 9.65052412385e-05*INTERNET\_USER) + (1.78055998403e-07*EDUCATION - 0.000104904419513*INTERNET\_USER)*@LOGIT(0.00564396328395*(GDP\_PER\_CAPITA(-3)-1096.68014672)) + 1105.2837696$$

The estimation results from the first estimate can be seen in table 1 below:

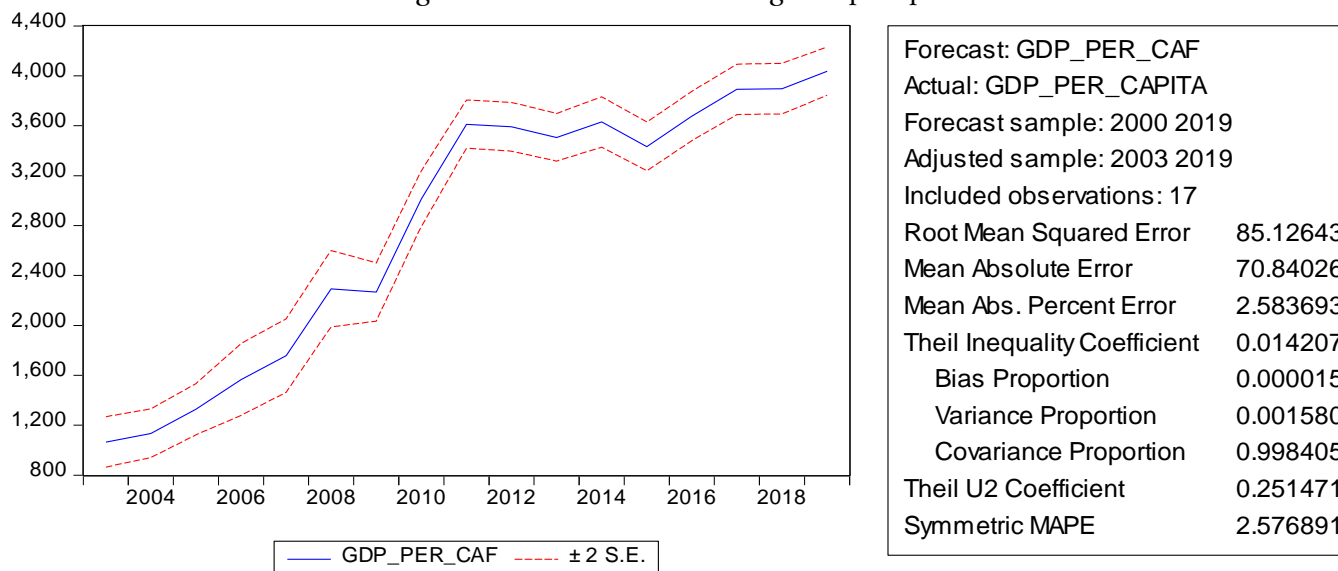
Table 1. Estimation Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Threshold Variables (linear part)				
EDUCATION	-8.74E-08	8.48E-08	-1.030311	0.3271
INTERNET_USER	9.65E-05	7.76E-05	1.244211	0.2418
Threshold Variables (nonlinear part)				
EDUCATION	1.78E-07	7.85E-08	2.268406	0.0467
INTERNET_USER	-0.000105	7.78E-05	-1.34831	0.2073
Non-Threshold Variables				
C	1105.284	265.7641	4.15889	0.002
Slopes				
SLOPE	0.005644	0.00427	1.32183	0.2157
Thresholds				
THRESHOLD	1096.68	299.2239	3.665082	0.0044
R-squared	0.994669	Mean dependent var		2805.471
Adjusted R-squared	0.99147	S.D. dependent var		1084.888
S.E. of regression	100.1969	Akaike info criterion		12.34505
Sum squared resid	100394.3	Schwarz criterion		12.68814
Log likelihood	-97.93296	Hannan-Quinn criter.		12.37916
F-statistic	310.9623	Durbin-Watson stat		1.367784
Prob(F-statistic)	0			

In the model equation, the estimation results for the linear phase threshold of the part or linearly constant education is negative, which means that there is an expenditure of people's income which is indicated by GDP per capita so that to invest in education it is necessary to sacrifice income to invest in education which has an impact on economic growth so that there is a positive relationship in the non-linear phase. For internet users, it acts as a driving force for education during the investment phase. The encouragement of internet users towards investment success is quite large which is seen in the linear phase and very minimal sacrifices seen in the non-linear phase. This means that information technology has a significant role in increasing the success of educational investments which are currently known as

online teaching or education systems. This has a positive impact or encourages economic growth which can be described in the forecasting table as follows:

Figure 1. The results of forecasting GDP percapita



From the forecast results shown in Figure 1, it can be seen that the GDP per capita graph can be pushed up very quickly. This shows that human resources and the use of the internet in education in Indonesia make a large contribution to people's income as indicated by the growth of GDP per capita.

### 5 CONCLUSION

Data behavior of Investment in education and technology in the pre-pandemic period can be seen very well in boosting the per capita income of people in Indonesia. This means that the online education system can be a practical solution in increasing the human capital of the Indonesian population through an online education system so that it can increase Indonesian human capital that can be used in economic development or production activities in Indonesia so that it can encourage people's income which in aggregate can encourage economic growth which means, the Indonesian economy has the opportunity to recover and grow by encouraging the improvement of online education services.

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