Trends in The Percentage of Primary School Students Accessing The Internet in Yogyakarta Province (As an Analysis of The Current State of Learning)

Tren Persentase Siswa Sekolah Dasar yang Mengakses Internet di Provinsi Yogyakarta (Sebagai Analisis Kondisi Pembelajaran Saat Ini)

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Abstract. *This study is a trend analysis of data on the percentage of primary school students who access the internet in Yogyakarta. The data is obtained from BPS-RI in the Education Statistics book which is published annually. Trend analysis was conducted for data from 2006 to 2023. The purpose of this research is to explore and examine more deeply the current state of learning. The research method used was explanatory sequential. The data has a general increasing trend. However, in 2022 and 2023 there was a decrease. The increase from 2016 is assumed to be due to easier and more internet facilities. After many people understand the shortcomings of online learning, blended learning was initiated which combines in-person learning and online learning. So that the prediction in 2024 the percentage value will increase again.*

Keywords - Trend analysis, Percentage, Education Statistics Book, Access the internet

Abstrak. Penelitian ini merupakan analisis tren dari data persentase siswa sekolah dasar yang mengakses internet di Yogyakarta. Data tersebut diperoleh dari BPS-RI dalam buku Statistik Pendidikan yang diterbitkan setiap tahun. Analisis tren dilakukan untuk data dari tahun 2006 hingga 2023. Tujuan dari penelitian ini adalah untuk mengeksplorasi dan mengkaji lebih dalam tentang kondisi pembelajaran saat ini. Metode penelitian yang digunakan adalah eksplanatori sekuensial. Data tersebut memiliki tren yang meningkat secara umum. Namun, pada tahun 2022 dan 2023 terjadi penurunan. Peningkatan dari tahun 2016 diasumsikan karena fasilitas internet yang semakin mudah dan banyak. Setelah banyak orang memahami kekurangan dari pembelajaran online, maka digagaslah blended learning yang menggabungkan antara pembelajaran tatap muka dan pembelajaran online. Sehingga prediksi di tahun 2024 nilai persentasenya akan kembali meningkat.

Kata Kunci - Analisis tren, Persentase, Buku Statistik Pendidikan, Akses internet

I.INTRODUCTION

The current era of education has been entered by globalisation and the industrial revolution 4.0, with information technology, especially the internet. The internet has become an important part of modern society, including in the field of education. The internet can be used to access various learning resources, such as learning materials, learning videos, and discussion forums. This can provide great benefits for students in their learning process. The central role in enriching and supporting the learning process has been largely taken over by the internet [1].

Widespread access to the internet can have a positive impact on learning conditions in primary schools. Students who have internet access can access various learning resources that can help them in understanding the subject matter. In addition, the internet can also be used to communicate with teachers and other students, thus improving interaction and collaboration in learning [2-3].

The Special Region of Yogyakarta (DIY), as one of the centres of education in Indonesia, is also feeling the impact of this change. This is very evident from the significant increase in the

percentage of students accessing the internet each year. The significant growth of information technology in recent years can no longer be denied. The development of telecommunications infrastructure and internet connectivity has increasingly provided wider access to the public, including primary school students. The availability of various electronic devices connected to the internet, such as smartphones and tablets, further expands the opportunities for access to information and learning among children [4-11].

Considering the important role of the internet in supporting learning, this study aims to explore data on the percentage of primary school students who access the internet in DIY Province. Furthermore, this study aims to analyse the trend of the percentage of primary skor students who access the internet in DIY Province. The analysis is also conducted by tracing the changes in this figure over time. This can provide an in-depth picture of the extent to which technology has become an integral part of educational life at the primary level.

However, beyond simply identifying trends, the impact of internet use on the current state of learning among primary school students in DIY is also analysed in this study. By understanding its positive and negative impacts, we can find out how the internet affects students' learning patterns, teacher-student interactions and classroom dynamics. Equally important, the factors that influence the trend of internet usage among primary school students in DIY Province will also be analysed next. These include social, economic, and cultural factors that can provide deeper insights into why and how internet access is used by students at the primary level.

The results of the study are expected to make a significant contribution to the formulation of education policies at the provincial level. By understanding the trend of internet use and its impact, authorities can take more appropriate steps in preparing the curriculum, supporting teacher development and integrating information technology in learning in primary schools in DIY Province. Overall, this research is expected to be an important contribution in improving the quality of education and adapting to the times in DIY.

II. RESEARCH METHODS

This research was conducted from October to November 2023 using secondary data from the Central Statistics Agency of the Republic of Indonesia (BPS-RI) from 2016 to 2023. The data studied is the percentage of students who access the internet in the last three months by province at each level of education. And this study focuses on data on students in primary schools in DI Yogyakarta province for urban, rural, and urban-rural.

This research applies mixed methods, namely the explanatory sequential method. The quantitative approach was used to analyse the trend of data on the percentage of primary school students accessing the internet in DI Yogyakarta from 2016 to 2023. After obtaining the data, it was followed by a qualitative approach to provide a more in-depth and comprehensive understanding of the data phenomenon under study.

Data analysis used to determine trend analysis is using linear and polynomial regression methods. Linear regression is used if the data has a linear trend and uses the formula $y=a+bx$. However, if the data is not linear, the polynomial method is used to determine the trend and formulate a model that fits the data.

III. RESULT AND DISCUSSION

This research begins with collecting secondary data. The secondary data used is the Indonesian Education Statistics book published by the Indonesian Statistics Agency (BPS). This data is released by BPS to be publicized to all Indonesian people and to find out the full picture of the portrait of Indonesian Education in that year. This data can be downloaded freely on the official website of BPS-RI. And in this research, the data set as secondary data is Indonesian Education statistics data from 2016 to 2023. Prior to 2016, the profile and content of Indonesian Education statistics data were in different formats.

Furthermore, this research only focuses on looking at data on elementary school students who access the internet in DIY. And here are the data summarized from the Indonesian Education statistics from 2016 to 2023,

Table 1.
Percentage of primary school students who access the internet in DI Yogyakarta

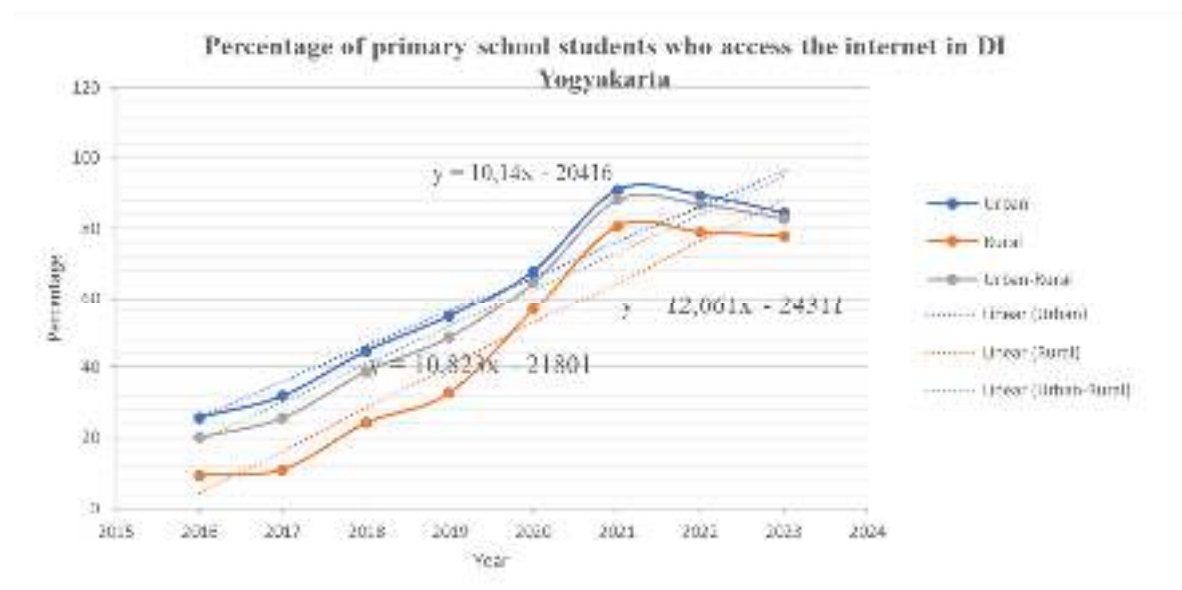| Tahun	Perkotaan	Perdesaan	Perkotaan & Perdesaan
2016	25,71	9,4	20,16
2017	31,81	11,08	25,73
2018	44,49	24,18	38,84
2019	54,52	32,73	48,57
2020	67,93	56,32	64,76
2021	90,93	80,71	88,26
2022	89,43	79,03	86,99
2023	84,41	78	82,79

Source: BPS-RI (2016-2023)

Figure 1.
Trends in the percentage of primary school students accessing the internet in DI Yogyakarta

The data on the percentage of primary school students who access the internet in Yogyakarta is divided into three basic data. The first data is urban data. This data shows the percentage of primary school students in urban areas, which is calculated by comparing the number of primary school students who access the internet with the total number of primary school students in urban areas. The second data is rural data. This data is calculated in the same way but in a different place,

namely in rural areas. And the third data is urban-rural data. This data is not an average of urban and rural data. This data is calculated as a whole region without dividing it into urban or rural areas. Of course, in the same way, namely the ratio of the number of primary school students who access the internet to the total number of primary school students in urban and rural areas [4-11].

It is clear from the graph above that the percentage of primary school students accessing the internet in Yogyakarta has increased significantly from year to year. This increase occurred in both urban and rural areas that were counted separately and urban-rural areas that were surveyed together.

Based on the shape of the graph that shows a linear trend, the most appropriate trend analysis is linear regression analysis. Linear regression is a data analysis technique used to predict the value of one variable with another variable. The variable to be predicted is called the dependent variable, while the variable used to predict the other variable is known as the independent variable. In linear regression, the relationship between the dependent variable and the independent variable is assumed to be a straight line. Mathematically, the relationship can be modelled as y=a+bx with y as the dependent variable in this study is the percentage of primary school students who access the internet, x as the independent variable in this study is year, a as a constant obtained from real conditions and based on data, and b is the gradient or rate of change that occurs, in this study what b means is the percentage increase per year that occurs [12-14].

Table 2.
Linear regression analysis of trends

Scope	Equation	Gradient
Urban	$y = 10,14x - 20416$	10,14
Rural	$y = 12,061x - 24311$	12,061
Urban-Rural	$y = 10,823x - 21801$	10,823

Gradient is a representation of change. In this research, the increase every year is formulated as a gradient. The gradient is interpreted to mean that the larger it is, the greater the change. The gradient data in urban areas is 10.14, so the annual increase is around this figure. The same applies to rural areas and urban-rural areas. It is clear that rural areas have the highest increase even though the total numbers are still higher than urban areas. This shows that the growth of primary school students accessing the internet is highest in rural areas.

Next, let us try to use the results of the trend analysis in the form of a model that is close to this data to predict the percentage of primary school students who access the internet in 2024. However, because there was a decline in 2021, the prediction calculation does not directly include the regression model obtained as a whole. Further analysis is needed by taking into account the decline that occurred in 2021. Therefore, we need a correction to the previous regression results. This corrected equation is used to predict the percentage of primary school students accessing the internet for 2024 in DIY.

Table 3.
Regression correction and prediction in 2024

Scope	Equation	Correction (decline after 2021)	Prediction in 2024
Urban	$y = 10{,}14x - 20416$	$y = 8{,}3857x - 16880$	92,6568
Rural	$y = 12{,}061x - 24311$	$y = 8{,}947x - 18017$	91,728
Urban-Rural	$y = 10{,}823x - 21801$	$y = 9{,}8x - 19747$	88,2

Further analysis of the data was then conducted to gain a deeper and more comprehensive understanding of the data phenomenon under study. The next analysis looks at the increase in the percentage of primary school students accessing the internet in DIY year by year. Then we relate the data phenomenon to the real conditions that influence the emergence of the data phenomenon.

Figure 2.
Increase in percentage of primary school students accessing the internet in urban areas
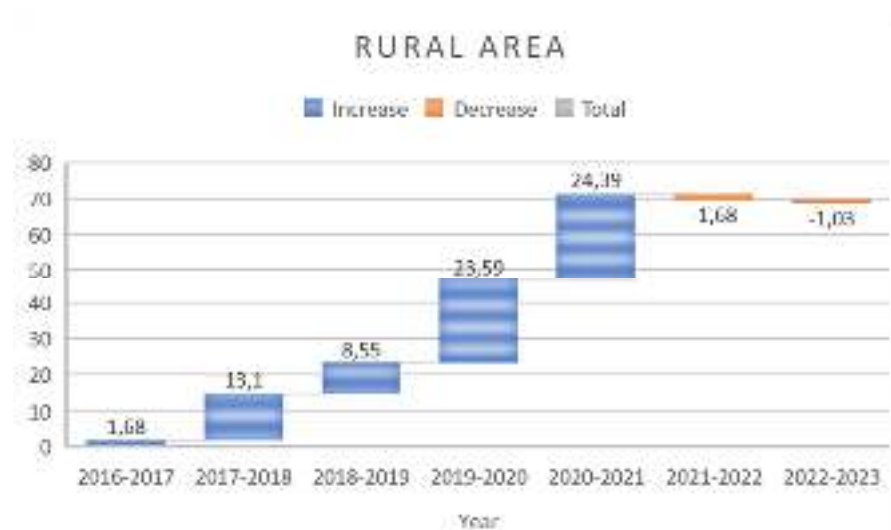

Figure 3.
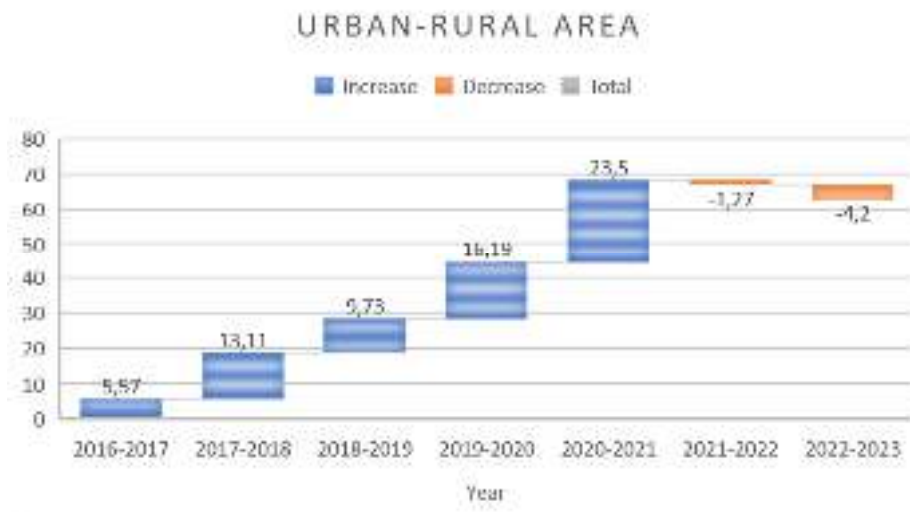Increase in percentage of primary school students accessing the internet in rural areas

Figure 4.
Increase in percentage of primary school students accessing the internet in urban-rural areas

The data on the percentage increase above shows that since 2016 there has been a significant increase. The development of the internet in primary schools means that it is progressing. Internet utilisation increases as the internet facilities themselves improve. Urban areas show almost double the percentage of internet access in rural areas. However, the increase in internet usage in rural areas beats the increase in urban areas.

With each year since 2016, the increase has also increased. And the peak of the increase is in 2021 towards 2022. If you pay attention to the context of the situation when that year was a pandemic period. The covid-19 pandemic which forced the disallowance of face-to-face learning to be the main factor in increasing internet access. The pandemic began in 2019, but in that year Indonesia had not yet implemented online learning. And this can be seen in the data that in 2019 there was an increase in internet access but not to exceed the increase in access in 2020 to 2022 [15-16].

When entering 2020, the government implemented a lock-down. This situation forces learning to be done online, using the internet. It can be seen in the data that then there was a much greater increase than in 2019. Then in 2021, the percentage of primary school students who access the internet is the highest (peak). If you look deeper, the cause of the peak in 2021 is the improvement of internet services and facilities which are much better than in 2020. The point is that in 2020, the internet has been used as an important player in learning. It's just that facilities and services are still lacking so that after that internet facilities and services develop, then in 2021 the percentage of primary school students accessing the internet is at its peak.

The next phenomenon is a decline in 2022 until it continues in 2023. This is related to the weakness of online learning. 2021 is the peak year of online learning implementation. All learning processes are conducted through the internet. Facilities support, learning applications make everything easy, and the cheap internet package packages provided by internet service providers.

It is undeniable that learning has its downsides. Addiction or dependence is the first impact that arises and is worrying for the development of learners. When learning habits have used the internet such as the learning process, delivery of material, delivery of assignments, implementation of

exams, attendance, and giving homework. Then dependence arises to continue using the internet. The internet is easy and makes it easy to do anything. This is an impact that must be resolved [17-18].

Furthermore, that learning is not only a process of transferring knowledge is a factor in the weakness of online learning that occurs. Learning also transfers values and attitudes. Values and attitudes cannot be transferred through the internet. Knowledge can be transferred easily through the internet. However, values and attitudes cannot be transferred to students if they are not face-to-face [19].

It is because of this understanding of the shortcomings of online learning that there has been a decline in online learning, so it can be seen in the data that in 2022 and 2023 there was a decrease in the percentage of primary school students accessing the internet. However, the following year is predicted to increase again. The negative factors and shortcomings of online learning have been given a solution with a learning that combines direct learning with online learning. We call this learning blended learning. So that the following year the percentage of primary school students who access the internet will continue to increase until all of them have internet access or the data will say 100%.

IV. CONCLUSION

The trend of the percentage of primary school students accessing the internet in DIY shows a good increasing significance. Since 2016, the percentage has increased until its peak in 2021. After that, the percentage trend decreased from 2022 to 2023. However, it is predicted that in 2024 it will increase again. This percentage increase is a form of progress. Then the peak percentage occurred during learning from the post-19 covid period. And at the end of 2021 many began to realise the shortcomings of the internet so that the data decreased. With the implementation of blended learning, the shortcomings of online learning can be reduced and internet usage will continue to increase.

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REFERENCES

[1] Batubara, Hamdan Husein. "Penggunaan google form sebagai alat penilaian kinerja dosen di Prodi PGMI Uniska Muhammad Arsyad Al Banjari." Al-Bidayah: jurnal pendidikan dasar Islam 8, no. 1 (2016).
[2] Sulistiyowati, Eka. "Peran Blog Sebagai Media Pembelajaran Di Madrasah Ibtidaiyah." Al-Bidayah: jurnal pendidikan dasar Islam 3, no. 2 (2011).
[3] Arrosyad, M. Iqbal, and Zonalisa Fhatri. "Actualization Of Integrated Learning During The Covid-19 Pandemic In Elementary Schools." Al-Bidayah: jurnal pendidikan dasar Islam 14, no. 1 (2022): 67-80.
[4] BPS. Potret Pendidikan Indonesia Statistik Pendidikan 2016. Jakarta: Badan Pusat Statistika. 2016.
[5] BPS. Potret Pendidikan Indonesia Statistik Pendidikan 2017. Jakarta: Badan Pusat Statistika. 2017.
[6] BPS. Potret Pendidikan Indonesia Statistik Pendidikan 2018. Jakarta: Badan Pusat Statistika. 2018.
[7] BPS. Potret Pendidikan Indonesia Statistik Pendidikan 2019. Jakarta: Badan Pusat Statistika. 2019.

[8] BPS. Potret Pendidikan Indonesia Statistik Pendidikan 2020. Jakarta: Badan Pusat Statistika. 2020.

[9] BPS. Statistik Pendidikan 2021. Jakarta: Badan Pusat Statistika. 2021.

[10] BPS. Statistik Pendidikan 2022. Jakarta: Badan Pusat Statistika. 2022.

[11] BPS. Statistik Pendidikan 2023. Jakarta: Badan Pusat Statistika. 2023.

[12] Seber, George AF, and Alan J. Lee. Linear regression analysis. Vol. 330. John Wiley & Sons, 2003.

[13] Kumari, Khushbu, and Suniti Yadav. "Linear regression analysis study." Journal of the practice of Cardiovascular Sciences 4, no. 1 (2018): 33-36.

[14] Montgomery, Douglas C., Elizabeth A. Peck, and G. Geoffrey Vining. Introduction to linear regression analysis. John Wiley & Sons, 2021.

[15] Yuangga, Kharisma Danang, and Denok Sunarsi. "Pengembangan media dan strategi pembelajaran untuk mengatasi permasalahan pembelajaran jarak jauh di pandemi covid-19." Jurnal Guru Kita PGSD 4, no. 3 (2020): 51-58.

[16] Zulfitria, Zulfitria, Ansharullah Ansharullah, and Rastia Fadhillah. "Penggunaan teknologi dan internet sebagai media pembelajaran di masa pandemi covid-19." In Prosiding Seminar Nasional Penelitian LPPM UMJ, vol. 2020. 2020.W.-K. Chen, Linear Networks and Systems. Belmont, CA: Wadsworth, 1993, pp. 123-135.

[17] Adi, Ni Nyoman Serma, Dewa Nyoman Oka, and Ni Made Serma Wati. "Dampak positif dan negatif pembelajaran jarak jauh di masa pandemi covid-19." Jurnal Ilmiah Pendidikan dan Pembelajaran 5, no. 1 (2021): 43-48.

[18] Pujilestari, Yulita. "Dampak positif pembelajaran online dalam sistem pendidikan Indonesia pasca pandemi covid-19." Adalah 4, no. 1 (2020): 49-56.

[19] Skulmowski, Alexander, and Kate Man Xu. "Understanding cognitive load in digital and online learning: A new perspective on extraneous cognitive load." Educational psychology review 34, no. 1 (2022): 171-196.