

The Influence of Household Socioeconomic Conditions on Elementary School Participation in Indonesia

Nia Enggrasari^{1*}, Wenny Restikasari²

Department of Economics, Faculty of Economics and Business, State University of Surabaya, Indonesia

Corresponding Author: Nia Enggrasari niaenggrasari.22019@mhs.unesa.ac.id

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ABSTRACT

This study aims to analyze the influence of household socioeconomic conditions on elementary school participation in Indonesia. The data used sourced from the 2023 National Socio-Economic Survey (SUSENAS) with a sample size of 146,602 children. The analysis method employed was binary logistic regression. The results of the study partially indicate that residence, gender, recipients of the Indonesia Smart Card (KIP), ownership of mobile phones (HP), internet access, and access to Information and Communication Technology (ICT) significantly affect elementary school participation. These findings suggest that children who have access to technology and educational support are more likely to pursue elementary education. Therefore, policies focusing on equitable access to education and technology in rural areas are needed to reduce disparities in school participation.

INTRODUCTION

The development of quality human resources is a key factor in advancing a country. According to (Savita, 2021), the economy will grow faster if a country has a large number of highly qualified human resources. By investing in education, the benefits are directly felt by individuals through increased knowledge and skills. Education also has a broad impact on society because it encourages productivity, fosters innovation, and strengthens the nation's competitiveness in the global era. Furthermore, education can help to see and understand the world from a broader perspective (Csaba Csintalan & Badulescu, 2015).

Commitment to quality education is emphasized in the fourth Sustainable Development Goal (SDG), which focuses on ensuring inclusive, equitable, and quality education and supporting lifelong learning opportunities for all people regardless of their social and economic background. The success of achieving SDG 4 is an important indicator for Indonesia in realizing sustainable development and equal learning opportunities. According to (Adipat & Chotikapanich, 2022), SDG 4 of the 2030 sustainable development goals focuses on efforts to ensure that everyone can obtain a quality education. Basic education is an important foundation for creating quality human resources. However, in reality, there are still serious problems related to school participation. In some areas, the number of elementary school students tends to decline, and some schools even experience a shortage of students to the point that there are no new registrants. This phenomenon shows that school participation rates are uneven and still face various obstacles. "Many public elementary schools experienced a shortage of students during the 2024 new student registration period. These schools remained empty even after the registration deadline had passed. The phenomenon of empty public elementary schools has been recurring in recent years." (detik.com, 2025).

School participation in this study is defined as the active involvement of children at the elementary school level. According to data from the Central Statistics Agency, although the Net Enrollment Rate (NER) for elementary schools in 2024 has reached 97.94%, there are still around 2.06% of children who have not received formal education. This figure is equivalent to hundreds of thousands of children missing the opportunity to obtain a basic education, which is an essential foundation for their future. According to (Muttaqin, 2018), although the Indonesian government has made various efforts to reduce educational disparities, it has not yet been fully achieved to date. Net Enrollment Rate (NER) is considered more appropriate in describing access and factors that support education. The Indonesian government targets a NER of 99% by 2030. Achieving this requires a joint effort from the government, society, and the private sector. (Mulyo Prayitno & Mami Hajaroh, 2024).

Data from the Central Statistics Agency (BPS), the Net Enrollment Rate (NER) from 2020 to 2024 shows an upward trend, albeit a relatively slow one. In 2020, the NER was recorded at 97.69 percent and continued to increase, reaching 97.95 percent in 2024. A GPE value of nearly 98 percent indicates that

almost all school-age children are enrolled in elementary school. Although the graph shows a positive trend, the rate of increase in GPE from year to year is still relatively slow. This shows that a small number of elementary school-aged children still face obstacles to attending school. With this achievement approaching 98 percent, the government's opportunity to reach the 99 percent target in 2030 is still realistic but requires extra effort from all relevant parties. However, this achievement requires continuous support from various parties to ensure that access to education is truly equitable. Indonesia is also committed globally to supporting and realizing SDG 4 on sustainable development, which states that everyone, without exception, has the right and opportunity to learn throughout their lives (Rakhmah et al., 2019).

School participation is closely related to the socioeconomic conditions of households. Families with better economic conditions are generally able to provide for their children's educational needs, from purchasing learning materials to accessing learning support facilities and information technology that supports the learning process. Households with better socioeconomic conditions tend to have greater opportunities to ensure that their children continue to participate in school, while families with limited resources often face obstacles in maintaining access to education, which can reduce the chances of elementary school students participating in school. It is widely recognized that the socioeconomic conditions of parents are linked to the risk of children dropping out of school (Winding & Andersen, 2015).

In addition to economic factors, social aspects such as parental education levels, technology utilization, and living environment also influence families' decisions to support their children to stay in school. In addition, educational assistance from the government in the form of the Indonesia Smart Card can help families economically to increase school participation opportunities. Thus, the socio-economic conditions of households are one of the important determinants in achieving equitable school participation. According to (Iddrisu & Alhassan, 2025), challenges arising from socioeconomic conditions have a profound impact on education and student learning outcomes. Despite the existence of free education programs, education costs still include various components such as uniforms, stationery, transportation, and other indirect costs, which can be a heavy burden for low-income households.

Based on the previous explanation, research on the relationship between household socioeconomic conditions and school participation is very important to study. Therefore, this study aims to analyze the influence of household socioeconomic conditions on elementary school participation. This study focuses on identifying the most significant factors that influence children's opportunities to attend school and producing strategic policy recommendations to improve equitable access to quality basic education. Based on this explanation, this study focuses on analyzing the factors that influence children's participation in elementary school. Furthermore, this study includes a literature review discussing previous theories and research, methods explaining data and analysis techniques, results and discussions

describing the research findings, and a conclusion containing appropriate conclusions and policy recommendations.

LITERATURE REVIEW

The level of education in urban areas is always higher than in rural areas (Gao & Li, 2022). In Nigeria, the low school enrollment rate among children in rural areas is mainly due to differences in family economic conditions. In cities, the job market demands a more educated workforce, which attracts people who have attended school and offers higher salaries (Stokes, 2015). Students from rural areas enroll in higher education at lower rates than students from urban areas. This is associated with lower average socioeconomic status (SES) in rural areas (Wells et al., 2023). Different findings by (Li et al., 2025) show that there is no significant difference in secondary school accessibility between urban and rural areas. This indicates that students living in urban and rural areas have almost equal opportunities in accessing education. Thus, Jinzhai County is considered to have achieved a certain level of balance in the distribution of educational resources between urban and rural areas.

In many regions of the world, the gender gap in higher education has actually reversed, with more women pursuing higher education compared to men (Gunnlaugsson et al., 2021). The PIP/KIP program supports student facilities and infrastructure for learning, with 55.8% of respondents strongly agreeing that PIP/KIP benefits students' families by facilitating online learning activities (Ninghardjanti et al., 2023). Additionally, students with higher smartphone usage tend to have better academic performance compared to students with lower usage. Thus, smartphone ownership and utilization can create differences in access and learning opportunities among primary school students (Wang et al., 2023).

Respondents believe that mobile phones should not be used during lessons because they can disrupt learning focus and pose security risks, such as misuse of photos or videos, bullying, etc. (Gath et al., 2024). Mobile devices can be utilized as learning media in career and technical education programs to equip students with skills that meet the demands of modern technology-based workplaces (Mupinga, 2017). Rural districts report that the number of students with access to adequate internet-enabled devices for online learning is much lower compared to urban districts (80.0% vs. 90.1%, with a significant difference of $p < 0.01$) (Graves et al., 2021). Access to ICT has a positive impact on students' academic achievement in schools (Alderete & Formichella, 2023).

METHODOLOGY

The data used in this study are secondary data sourced from National Socio-Economic Survey (SUSENAS), which was conducted in March 2023. SUSENAS is a survey carried out by Central Bureau of Statistics (BPS) to understand the socioeconomic conditions of the Indonesian population. This study focuses on children attending elementary school, with a total of 146,602 research subjects. The dependent variable in this study is elementary school participation, with a dummy variable 1 = attending elementary school, 0 = not

attending elementary school. Meanwhile, the independent variables in this study are detailed further in Table 1.

Table 1. Independent Variable

No.	Variable	Operational Definition	Code
1	Residence	Resident's area of residence	1 = urban, 0 = rural
2	Gender	Residents' biological identity	1 = male, 0 = female
3	KIP (ownership)	Possession of the government's Indonesia Smart Card	1 = has a KIP card, 0 = does not have a KIP card
4	HP (ownership) Internet	Resident's possession of mobile phones	1 = has a HP, 0 = does not HP 1 = accesses the internet,
5	(access)	Access to internet usage	0 = does not access the internet
6	ICT (access)	Access to Information and Communication Technology learning	1 = accesses ICT, 0 = does access ICT

The analytical methods used in this study are descriptive and inferential analysis. Descriptive analysis is conducted to provide an overview of the characteristics of the population elementary school. Meanwhile, inferential analysis in this study uses quantitative data with the binary logistic regression method. The binary logistic regression method was used to analyze the factors that influence school participation. This study used cross-sectional data from 2023 and was processed using Stata 17 software.

Data analysis in this study used the binary logistic regression method. This model was chosen because the dependent variable is dichotomous with values of 0 and 1, so binary logistic regression is appropriate for examining the effect of independent variables on the probability of school participation. Independent variables can be seen through the odds ratio in logistic regression (Gujarati, 2009).

In this model binary logistic regression is :

$$P_i = \frac{e^{\beta_0 + \beta_1 \text{Residence} + \beta_2 \text{Gender} + \beta_3 \text{KIP} + \beta_4 \text{HP} + \beta_5 \text{Internet} + \beta_6 \text{ICT}}}{1 + e^{\beta_0 + \beta_1 \text{Residence} + \beta_2 \text{Gender} + \beta_3 \text{KIP} + \beta_4 \text{HP} + \beta_5 \text{Internet} + \beta_6 \text{ICT}}} + \varepsilon$$

The probability of school participation this study is attending elementary school and not attending elementary school. A dummy value of 1 = attending school and a dummy value of 0 = not attending school. With β_0 as the constant value, β_1 to β_6 are the regression coefficients. Meanwhile, the independent variables used in this model are dummy variables, residence, gender, Indonesia Smart Card (KIP) ownership, mobile phones (HP)

ownership, internet access, and Information and Communication Technology (ICT) access.

RESEARCH RESULT

Descriptive Statistics

Based on the 2023 Susenas data sample used in this study, there were 146,602 children, with 98.25 percent attending elementary school, while the remaining 1.75% did not attend elementary school. Although the percentage of the population attending school is high, it still requires attention because, in reality, there are still 1.75 percent of children who should be in elementary school but are not. The percentage of the population not attending school is still relatively high because all children of that age should be attending elementary school. The population analyzed in this study predominantly lives in rural areas, accounting for 60.64 percent, while those living in urban areas make up 39.36 percent. Furthermore, when looking at the gender of the population studied by the author, males are dominant at 51.49 percent, while females account for 48.51 percent.

Meanwhile, when viewed from the ownership of KIP, a large portion of the population studied still does not have a KIP, amounting to 82.22 percent, while those who have a KIP are only 13.78 percent. Regarding mobile phone ownership, the majority of the population studied tend to not own a phone, accounting for 69.95 percent, while those who own a phone are 30.05 percent. The population studied by the author is predominantly already accessing the internet, with a figure of 55.54 percent, while those who have never accessed the internet account for 44.66 percent. Moreover, the population who have studied ICT is still small, only 8.74 percent, whereas those who have never studied ICT tend to be numerous, amounting to 91.26 percent.

Partial Test Results

Partial test results show that all independent variables affect the participation of elementary school residents in Indonesia, considering the significance level (<0.05). Based on Table 2 below, the p-value for all independent variables is less than 0.05, so it can be concluded that the independent variables consisting of residence, gender, ownership of KIP, ownership of a mobile phone, internet access, and ICT access significantly influence the participation of elementary school residents in Indonesia in 2023.

Table 2. Partial Test Results

Variable	Coefisien	Ratio Odds	P Value
Residence	0.749	2.116	0.000
Gender	0.184	0.831	0.000
KIP (ownership)	2.341	10.397	0.000
HP (ownership)	0.663	1.941	0.000
Internet (access)	1.156	3.177	0.000
ICT (access)	1.100	3.006	0.000

Model Suitability Test Results

Based on the above data test results, it can be seen that the Pseudo R2 value is 0.0881, which means that the model is able to explain 8.81% of the variation in the data well or the model is declared fit. This indicates that the variable of school participation opportunity can be explained by independent variables such as place of residence, gender, KIP ownership, cell phone ownership, internet access, and computer access by 8.81%. The pseudo R2 value can be categorized as sufficient, so that the model used has a moderate ability to explain the relationship between the independent and dependent variables. The value of 0.881 may seem low, but the sample size used is large, so the pseudo R2 is still significant. In binary regression models, model suitability is secondary (Gujarati, 2009).

Table 3. Model Suitability Test Results

Pseudo R2	0.0881
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DISCUSSION

Analysis based on place of residence reveals a significant gap in school participation between urban and rural areas. Children living in urban areas show higher levels of school participation than those living in rural areas. This difference statistically shows a strong and significant relationship. These findings can be explained by several fundamental factors. One such factor is the availability of better educational infrastructure in urban areas, with schools located closer to home and easier access to transportation. Rural residents have to travel further to school, there are fewer schools available, and they often have to travel more than 10 km to the nearest school (Petre et al., 2025). In addition, the quality of schools in urban areas is generally better, with more complete learning facilities and higher-quality teaching staff. The allocation of educational resources tends to favor urban areas. Schools in cities usually have more adequate facilities, better qualified teaching staff, and are able to organize more varied and sustainable learning activities. In contrast, schools in rural areas often face limitations in terms of facilities, a limited curriculum, and difficulties in developing the quality of education (Ma, 2025).

This study is in line with research conducted by (Ainantia et al., 2025), which confirms that there is still a gap in school participation between children aged 7–12 years in urban and rural areas, as well as between provinces in Indonesia. Although the national school participation rate (APS) continues to increase, regions such as East Nusa Tenggara, West Kalimantan, Central Sulawesi, West Sulawesi, and Papua still record low achievements. These differences are influenced by socioeconomic factors, geographical conditions, limited educational infrastructure, and cultural backgrounds. Research conducted by Zhang et al. (2025) explains that research in Dalian (China) shows that urbanization has a positive effect on the quality of and access to education. These findings show that schools in the city center are of higher quality than those in the suburbs. Infrastructure, particularly sports facilities and learning equipment, proved to be more decisive than teacher strength in improving school quality.

Housing prices and population size were positively correlated with school quality, especially at the elementary school level. These findings confirm that living in urban areas increases the chances of gaining access to quality schools, thereby encouraging higher educational participation. In addition, a study by Zangana et al. (2024) found that schools in Erbil are not evenly distributed, with most located in the city center while the suburbs lack schools. Furthermore, the use of a two-shift system in many schools reduces the number of learning hours each year, thereby affecting the quality of education. This shows that living in urban areas does not always guarantee better access to or quality of education, as infrastructure gaps and resource allocation disparities still exist.

The results of logistic regression analysis show that the male gender variable has a negative and significant effect on elementary school participation. This variable indicates that boys are less likely to participate in formal education than girls. An interesting finding from this study is that boys show lower levels of school participation than girls. In the last fifty years, girls' participation in education has increased significantly in many countries. As a result, more girls are attending school than in previous generations. This increase demonstrates the success of programs designed to support girls' education. However, in most countries, girls still lag behind boys. This is evident in their limited access to education and the differences in the quality of education they receive. These findings confirm that although girls' participation continues to increase, there are still major challenges in achieving real educational equality between boys and girls (Evans et al., 2020).

The results of this study are in line with (Fonseca et al., 2023), which shows that at the elementary education level, girls generally excel in reading compared to boys, contributing to their increased participation in school. Another finding by (Ahmed, 2024), which explains the development of public universities in Ethiopia, found a positive spillover effect on secondary education, especially for female students. The presence of universities in the vicinity of residential areas increases women's participation and academic achievement, thus demonstrating that investment in higher education also promotes gender equality at lower levels.

Studies have produced different findings, explaining that in Pakistan, using household data from 2005–2019, boys have a higher chance of reaching higher education than girls. Although current enrollment rates are relatively equal, there is a significant gap in long-term educational attainment. Socioeconomic factors in households are more supportive of boys' education, while discrimination and low economic returns are barriers to girls' education (Pasha, 2024).

The Indonesia Smart Card program has had a very significant positive impact on school participation. Children who are KIP recipients show much higher levels of school participation compared to those who do not receive this assistance. These findings confirm the effectiveness of educational social assistance programs in overcoming economic barriers that are the main

obstacles to school participation. The success of the KIP program lies not only in the direct financial assistance provided, but also in the psychological and social impact it has. This program creates an understanding at the family level about the importance of education and provides moral support that the state cares about their children's education. PIP recipients who also receive mentoring report that financial assistance and mentoring help them feel more confident about continuing their higher education. This shows that they feel moral support that the government cares about their condition (History, 2023).

The results of this study are in line with research (Ulfa & Rezki, 2024) which shows that the Indonesia Pintar Program (PIP) has succeeded in increasing school participation at all levels of education, with the greatest impact at the high school level and stronger in rural areas. PIP recipients generally come from low-income families with simple household characteristics and low-educated parents. Other studies have also found that 16-18 year olds from the bottom 40 percent who receive assistance have a greater and more significant chance of attending high school. This assistance has been shown to increase high school participation rates by 15-25 percent (Caniago et al., 2021). Research shows that children who are recipients of the Indonesia Smart Program (PIP) have a much greater chance of continuing their education to senior high school (SMA) compared to children who do not receive this assistance. This shows that conditional cash assistance such as PIP not only provides direct financial support to poor families, but also increases the likelihood of children's participation in secondary education, especially in areas that previously had limited access to schools (Susilo & Wahyudi, 2020).

Mobile phone ownership has been proven to have a positive effect on children's school participation. Children from families who own mobile phones attend school more than those from families who do not. This is because mobile phones facilitate communication between parents and schools, provide access to information and digital learning materials, and reflect better family economic conditions. By calling parents or guardians to convey information about their children's attendance at school, the attendance rate of students in the experimental group increased. This confirms that communication via mobile phones between schools and parents plays an important role in encouraging children's participation in school (Rajput, 2020).

The results of this study are in line with (Guerrero et al., 2016), which shows that when mobile devices (such as smartphones) are used in the classroom (with applications such as Socrative), student participation increases, they are more active in classroom activities, and share their results with high scores. Another similar study (Wang et al., 2023) found that elementary school students who used smartphones more frequently had better academic performance than those who used them less frequently. The authors concluded that access to smartphones can be a positive learning opportunity, as long as they are used to support academic goals. Research produced by (Izquierdo-Condoy et al., 2024), in the context of medical education in Latin American

countries, found that the use of smartphones for academic purposes (e.g., accessing educational videos, science applications) was significantly correlated with academic progress. This means that in higher education environments, mobile devices support the learning process.

Excessive use of mobile phones can reduce focus on learning, interfere with study time management, and cause health problems. Therefore, educational institutions need to make efforts to raise awareness and shape more responsible digital habits (Ali et al., 2025).

Internet access has been shown to have a positive effect on children's school participation. Families with internet access tend to have children who attend school more regularly than families without it. The internet helps children learn through online resources, facilitates communication with teachers and friends, and has become an essential requirement for online learning since the pandemic. According to (Ladrón de Guevara Rodríguez et al., 2022), the use of the internet for learning and completing school assignments is positively correlated with academic achievement in various subjects.

The results of this study are in line with (Zakir et al., 2025), showing that increased digital literacy, which depends on internet access for practice and learning, mediates the relationship between technology access and academic success, meaning that access and digital skills together increase participation and achievement. Research conducted by (Amponsah et al., 2022) found that the use of the internet for academic purposes among high school students was associated with improved learning outcomes, thus emphasizing the importance of internet access at home in supporting students' learning processes outside of school. Additionally, other research has found that participation in online classes requiring internet access is positively associated with the opportunity to take exams, graduation rates, and final grades, illustrating a direct relationship between online engagement and academic success (Martínez-Serna et al., 2024).

However, other researchers believe that excessive internet use is linked to a decline in student academic performance, as evidenced by lower average grades and higher failure rates. This confirms that unwise use of internet access can actually have a detrimental effect on learning outcomes (Hazelhurst et al., 2011). In addition, the use of social media and digital devices can reduce academic learning time because students are more distracted, limiting their concentration and potentially reducing learning outcomes (Gök, 2015).

Access to Information and Communication Technology (ICT) has been proven to have a significant impact on increasing school participation. The presence of digital devices and ICT-based learning media provides opportunities for students to be more active in the learning process. They are no longer passive listeners but are also involved through discussions, quizzes, and online forums. Research shows that ICT can expand students' access to various learning resources, facilitate understanding of the material, and foster motivation and independence in learning. With access to ICT, students find it easier to follow lessons, attend class more regularly, and are

encouraged to complete higher levels of education. The results of a survey conducted by (Ghavifekr & Rosdy, 2015) show that the application of ICT in schools is considered to be able to improve the quality of the learning process. Teachers who use technology in a planned manner can increase student engagement, enrich teaching strategies, and foster motivation to learn.

The results of this study are in line with (Yngve et al., 2023), which assessed two aspects of participation, namely attendance and involvement. The results of the study found that the use of ICT can expand opportunities for student participation. Technology provides alternative channels for students, especially those with special needs, to remain involved in various school activities. In line with research conducted by (Liebenberg et al., 2012), research in the context of distance learning shows that students' ability to actively participate in online lectures is greatly influenced by access to and skills in using technology. With the support of access to and mastery of technology, their level of participation tends to increase. In line with (Bergman & Chan, 2021), experimental and quasi-experimental studies in the United States and various other countries show that the use of technology-based interventions, such as sending automatic messages to parents or utilizing notification platforms, is effective in reducing student absenteeism and increasing attendance. These findings confirm that ICT has an important contribution to improving attendance, which is part of school participation.

Despite its many advantages, the use of ICT also has negative effects, such as distractions, increased dependence on digital devices, and difficulty distinguishing between study time and non-academic activities (Küçük, 2023).

CONCLUSION AND RECOMMENDATION

The results of this study indicate that school participation among children elementary school is influenced by various socioeconomic factors. Place of residence, ownership of a Kartu Indonesia Pintar (KIP) card, ownership of a mobile phone, internet access, and access to information and communication technology (ICT) have been shown to have a significant positive influence on children's opportunities to attend school. Conversely, gender has a negative influence, with boys tending to participate less in elementary education than girls. These findings underscore the importance of educational assistance programs such as KIP, which have proven effective in increasing participation, although the mechanisms for distribution and validation of recipient data still need to be improved to ensure greater accuracy. Based on these findings, policy recommendations that can be proposed include expanding the coverage of the KIP program for poor families, especially in rural areas, and improving educational infrastructure and transportation access in remote areas. In addition, the digital literacy of children and families also needs to be strengthened so that the use of mobile phones and the internet can better support academic activities. The government needs to pay special attention to the low participation of boys through targeted learning motivation program

policies. With these strategic steps, the target of increasing school participation to 99% by 2030 can be more realistically achieved.

ADVANCED RESEARCH

This study has limitations because it only uses cross-sectional data from SUSENAS 2023, so it cannot describe the dynamics of changes in school participation over time. This study only uses limited variables, while other factors such as parental income, parental education, school facilities, and school infrastructure conditions have not been studied in depth. Therefore, further research can use panel data or a qualitative approach to explore the determinants of school participation further. In addition, other relevant variables such as the role of parents, children's motivation, and the quality of educational services can be added.

REFERENCES

- Adipat, S., & Chotikapanich, R. (2022). Sustainable Development Goal 4: An Education Goal to Achieve Equitable Quality Education. *Academic Journal of Interdisciplinary Studies*, 11(6), 174–183. <https://doi.org/10.36941/ajis-2022-0159>
- Ahmed, M. H. (2024). University expansion and female adolescents' educational attainment in Ethiopia. *Empirical Economics*, 67(2), 417–448. <https://doi.org/10.1007/s00181-024-02557-4>
- Ainantia, S. W., Hidayat, A., Muhammadiyah, U., Belitung, B., & Ohio, T. (2025). *The School Participation Rates in Various Provinces and Residential Areas of Indonesia between 2021 and 2024*. 1(1), 24–37.
- Alderete, M. V., & Formichella, M. M. (2023). Access to ICT at Argentine elementary school children's homes and its impact on school achievements. *Education and Information Technologies*, 28(3), 2767–2790. <https://doi.org/10.1007/s10639-022-11227-w>
- Ali, Y., Mushtaq, S., Shahnawaz, A., Un Nisa, Z., Irraj Khan, H., & Shahreen,. (2025). Impact of Excessive Use of Mobile Phone on Academic Performance of Students of Mohtarma Benazir Bhutto Shaheed Medical College. *Biological and Clinical Sciences Research Journal*, 6(5), 87–90. <https://doi.org/10.54112/bcsrj.v6i5.1759>
- Amponsah, K. D., Aboagye, G. K., Narh-Kert, M., Commey-Mintah, P., & Boateng, F. K. (2022). The Impact of Internet Usage on Students' Success in Selected Senior High Schools in Cape Coast metropolis, Ghana. *European Journal of Educational Sciences*, 9(2), 1–18. <https://doi.org/10.19044/ejes.v9no2a1>
- Bergman, P., & Chan, E. (2021). Leveraging Technology to Engage Parents at Scale: Evidence from a Randomized Controlled Trial. *SSRN Electronic Journal*, February. <https://doi.org/10.2139/ssrn.2989472>
- Caniago, P., Elfindri, & Sari, D. T. (2021). Economics Development Analysis Journal Education Cash Transfer and High School Enrollment in Indonesia. *Economics Development Analysis Journal*, 10(2), 184–204. <http://journal.unnes.ac.id/sju/index.php/edaj>

- Csaba Csintalan, & Badulescu, A. (2015). Education and Human Capital as Engines for Economic Growth. A Literature Review. *The Annals of the University of Oradea. Economic Sciences*, XXIV(2), 665–674. <http://widgets.ebscohost.com/prod/customerspecific/s9118275/vpn.php?url=http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,u id&db=buh&AN=117725783&site=eds-live&scope=site>
- Evans, D. K., Akmal, M., & Jakiela, P. (2020). *Gender Gaps in Education: The Long View Working Paper 523 January 2020. January 2020.* <https://www.cgdev.org/sites/default/files/gender-gaps-education-long-view.pdf>
- Fonseca, J., Bahrawar, L., Dubeck, M. M., Sitabkhan, Y., Cummiskey, C., & Unadkat, D. (2023). Girls have academic advantages and so do boys: A multicountry analysis of gender differences in early grade reading and mathematics outcomes. *RTI Press., May.*
- Gao, X., & Li, M. (2022). Differences between returns to education in Urban and rural China and its evolution from 1989 to 2019. *PLoS ONE*, 17(10 October), 1–20. <https://doi.org/10.1371/journal.pone.0274506>
- Gath, M. E., Monk, L., Scott, A., & Gillon, G. T. (2024). .AR applications applied in the construction industry Smartphones at School: A Mixed-Methods Analysis of Educators' and Students' Perspectives on Mobile Phone Use at School. *Education Sciences*, 14(4).
- Ghavifekr, S., & Rosdy, W. A. W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. *International Journal of Research in Education and Science*, 1(2), 175–191. <https://doi.org/10.21890/ijres.23596>
- Gök, T. (2015). the Positive and Negative Effects of Digital Technologies on Students' Learning. *International Conference on Education in Mathematics, Science & Technology (ICEMST), April 23-26, 2015 Antalya, Turkey*, 2, 173–177. www.isres.org
- Graves, J. M., Abshire, D. A., Amiri, S., & Mackelprang, J. L. (2021). Disparities in Technology and Broadband Internet Access across Ruralty: Implications for Health and Education. *Family and Community Health*, 44(4), 257–265. <https://doi.org/10.1097/FCH.0000000000000306>
- Guerrero, C., Jaume, A., Juiz, C., & Lera, I. (2016). Use of mobile devices in the classroom to increase motivation and participation of engineering university students. *IEEE Latin America Transactions*, 14(1), 411–416. <https://doi.org/10.1109/TLA.2016.7430109>
- Gunnlaugsson, G., Baboudóttir, F. N., Baldé, A., Jandi, Z., Boiro, H., & Einarsdóttir, J. (2021). Public or private school? Determinants for enrolment of adolescents in Bissau, Guinea-Bissau. *International Journal of Educational Research*, 109(February), 1–15. <https://doi.org/10.1016/j.ijer.2021.101851>
- Hazelhurst, S., Johnson, Y., & Sanders, I. (2011). *An empirical analysis of the relationship between web usage and academic performance in undergraduate students.* 1–23. <http://arxiv.org/abs/1110.6267>

- Iddrisu, H. M., & Alhassan, A. S. (2025). *The Impact of Parents ' Socioeconomic Status on Students ' Educational Success in Senior High Schools in the Northern Region of Ghana*. 16(2), 49–64. <https://doi.org/10.29329/ijer.2025.1320.3>
- Izquierdo-Condoy, J. S., Arias-Intriago, M., Nati-Castillo, H. A., Gollini-Mihalopoulos, R., Cardozo-Espínola, C. D., Loaiza-Guevara, V., Dalel- Gómez, W., Villamil, J., Suárez-Sangucho, I. A., Morales-Lapo, E., Tello-De-Torre, A., Hall, C., & Ortiz-Prado, E. (2024). Exploring smartphone use and its applicability in academic training of medical students in Latin America: a multicenter cross-sectional study. *BMC Medical Education*, 24(1). <https://doi.org/10.1186/s12909-024-06334-w>
- Küçük, T. (2023). Technology Integrated Teaching and Its Positive and Negative Impacts on Education. *International Journal of Social Sciences & Educational Studies*, 10(1), 46–55. <https://doi.org/10.23918/ijsses.v10i1p46>
- Ladrón de Guevara Rodríguez, M., Lopez-Agudo, L. A., Prieto-Latorre, C., & Marcenaro-Gutierrez, O. D. (2022). Internet use and academic performance: An interval approach. In *Education and Information Technologies* (Vol. 27, Issue 8). Springer US. <https://doi.org/10.1007/s10639-022-11095-4>
- Li, X., Mahdzar, S. S. S., Khaidzir, K. A. M., & Ismail, I. E. (2025). The relationship between accessibility of urban and rural high schools and enrollment rate: A county-level study. *Plos One*, 20(6 June), 1–17. <https://doi.org/10.1371/journal.pone.0325263>
- Liebenberg, H., Chetty, Y., & Prinsloo, P. (2012). Student access to and skills in using technology in an open and distance learning context. *International Review of Research in Open and Distance Learning*, 13(4), 250–268. <https://doi.org/10.19173/irrodl.v13i4.1303>
- Ma, Z. (2025). A multidimensional analysis of the differences in urban and rural education in China. *Journal of Education and Educational Policy Studies*, 3(2), 1–5. <https://doi.org/10.54254/3049-7248/2025.21803>
- Martínez-Serna, M. I., Baixauli-Soler, J. S., Belda-Ruiz, M., & Yagüe, J. (2024). The effect of online class attendance on academic performance in finance education. *International Journal of Management Education*, 22(3). <https://doi.org/10.1016/j.ijme.2024.101023>
- Mulyo Prayitno, & Mami Hajaroh. (2024). Analysis of Gross Enrollment Ratio, Net Enrollment Ratio, and School Enrollment Ratio Trends at the Elementary School Level. *Journal of Educational Learning and Innovation (ELIa)*, 4(1), 18–36. <https://doi.org/10.46229/elia.v4i1.809>
- Mupinga, D. M. (2017). <p>School-wide and Classroom Policies on the Use of Mobile Technologies: An Exploratory Study</p>. *Journal of Technology Studies*, 43(2), 70–79. <https://doi.org/10.21061/jots.v43i2.a.2>
- Muttaqin, T. (2018). Determinants of Unequal Access to and Quality of Education in Indonesia. *Jurnal Perencanaan Pembangunan: The Indonesian Journal of Development Planning*, 2(1), 1–23. <https://doi.org/10.36574/jpp.v2i1.27>
- Ninghardjanti, P., Murtini, W., Hindrayani, A., & Sangka, K. B. (2023). Evaluation of the Smart Indonesia Program as a Policy to Improve

- Equality in Education. *Sustainability* (Switzerland), 15(6).
<https://doi.org/10.3390/su15065114>
- Petre, A. A., Dumitrache, L., Mareci, A., & Cioclu, A. (2025). The Urban–Rural Education Divide: A GIS-Based Assessment of the Spatial Accessibility of High Schools in Romania. *ISPRS International Journal of Geo-Information*, 14(5), 1–20. <https://doi.org/10.3390/ijgi14050183>
- Rajput, N. H. (2020). Technology in action: Ascertaining the impact of cell phone calls on middle school students placed at risk of drop out. *Indian Journal of Science and Technology*, 13(40), 4224–4233. <https://doi.org/10.17485/ijst/v13i40.1236>
- Rakhmah, B. I., Ari, I. R. D., & Rukmi, W. I. (2019). Spatial Modeling on Net Enrollment Rate of Junior High in Mataram. *International Journal of Innovative Science and Research Technology*, 4(7). www.ijisrt.com158
- Savita, K. (2021). *An Analytical Study of Education as a Human Capital and Investment for Economic Development of a Nation* An Analytical Study of Education as a Human Capital and Investment for Economic Development of a Nation. November.
- Stokes, C. S. (2015). *HHS Public Access*. 54(2), 295–319. <https://doi.org/10.1086/652139.School>
- Susilo, H., & Wahyudi, S. T. (2020). Keeping rural children’s hope to stay in the Senior High School through conditional cash transfer: An Indonesian case. *Sebelas Maret Business Review*, 5(1), 1. <https://doi.org/10.20961/snbr.v5i1.41197>
- Ulfa, M. F., & Rezki, J. F. (2024). Economics Development Analysis Journal The Impact of The Program Indonesia Pintar on School Participation. *Economics Development Analysis Journal*, 13(1), 140–151. <http://journal.unnes.ac.id/sju/index.php/edaj>
- Wang, J. C., Hsieh, C. Y., & Kung, S. H. (2023). The impact of smartphone use on learning effectiveness: A case study of primary school students. In *Education and Information Technologies* (Vol. 28, Issue 6). Springer US. <https://doi.org/10.1007/s10639-022-11430-9>
- Wells, R. S., Chen, L., Bettencourt, G. M., & Haas, S. (2023). Reconsidering Rural-Nonrural College Enrollment Gaps: The Role of Socioeconomic Status in Geographies of Opportunity. *Research in Higher Education*, 64(8), 1089–1112. <https://doi.org/10.1007/s11162-023-09737-8>
- Winding, T. N., & Andersen, J. H. (2015). Socioeconomic differences in school dropout among young adults: The role of social relations. *BMC Public Health*, 15(1), 1–11. <https://doi.org/10.1186/s12889-015-2391-0>
- Yngve, M., Ekbladh, E., Lidström, H., & Hemmingsson, H. (2023). Information and communication technology to improve school participation among upper secondary school students with special educational needs. *Scandinavian Journal of Occupational Therapy*, 30(3), 311–321. <https://doi.org/10.1080/11038128.2021.1998610>
- Zakir, S., Hoque, M. E., Susanto, P., Nisaa, V., Alam, M. K., Khatimah, H., & Mulyani, E. (2025). Digital literacy and academic performance: the mediating roles of digital informal learning, self-efficacy, and students’

- digital competence. *Frontiers in Education*, 10(June), 1–13.
<https://doi.org/10.3389/feduc.2025.1590274>
- Zangana, D. D., Ibrahim, A. J., Yuan, H., & Amani-Beni, M. (2024). Educational inequality in urban settings: A spatial analysis of school distribution and double-shift system challenges – A case study. *Journal of Urban Management*, 13(4), 832–849.
<https://doi.org/10.1016/j.jum.2024.08.004>
- Zhang, Z., Luan, W., Tian, C., & Su, M. (2025). Impact of Urban Expansion on School Quality in Compulsory Education: A Spatio-Temporal Study of Dalian, China. *Land*, 14(2).
<https://doi.org/10.3390/land14020265>