

Digital inclusion for vulnerable community in urban areas: skills enhancement for students in Islamic Boarding School

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Abstract: This research is a study related to digital inclusion strategies at the Al Ashriyyah Nurul Iman Foundation in Parung, Bogor, which provides free education for vulnerable children from underprivileged families in urban areas. With the advancement of technology, vulnerable groups face challenges in the form of inequalities in access to essential services. Inclusive digitalisation is considered capable of overcoming this inequality, as it can be a tool for empowering marginalised communities. Using descriptive qualitative methods, data was collected through interviews with eight alumni and the head of the Islamic boarding school, as well as observation and document review. Thematic analysis was used to identify patterns in the data. The results of this study indicate that these boarding schools implement digital inclusion strategies by providing technology training, internet access, and the use of digital platforms. These initiatives improve digital skills and ultimately enhance the digital technical capabilities of students from underprivileged backgrounds, thereby increasing their opportunities in the world of work. The implications of this research highlight the importance of developing a digital inclusion model that promotes independence and can be adopted by other educational institutions, especially those in urban areas. In addition, this research emphasises the urgency of equipping vulnerable populations with digital skills to facilitate their integration into an increasingly digital society.

Key Words: *vulnerable people, digital inclusion, digital skill, islamic boarding school, urban area*

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Introduction

Rapid technological growth has led to more people living in urban areas, including vulnerable groups. Flakerud & Winslow (1998) stated in their research that this situation

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causes people from difficult backgrounds to have increasingly limited resources, face higher health risks and premature death, and often face social, physical, psychological and economic challenges.

Vulnerable groups include the poor, children, the elderly, ethnic minorities, veterans, individuals with mental disorders, and those suffering from chronic diseases. In urban environments, vulnerable groups face significant technological barriers that exacerbate their marginalisation and limit their access to essential services and opportunities. The digital divide can be a serious problem because the large number of disadvantaged communities that do not have access to telecommunications and basic skills widens the gap, so what is needed is the availability of effectively accessible technology (Domínguez Castillo et al., 2019). The most crucial factor widening the digital divide is the difficult economic situation of low-income groups, which further limits their access to technology and the internet. Lack of financial resources is the main obstacle, as is also the case with access to health services, where high costs and structural barriers prevent fair access to services (Neugebauer, 2024). On the other hand, although digital platforms have the potential to increase inclusion and welfare, technology also brings new challenges. Security issues, data leaks and privacy violations pose significant risks to users, especially those with low digital literacy (Andako, 2023). Rapid urbanisation in developing countries has led to improved living conditions and access, but gaps in various areas remain difficult to overcome (Xu et al., 2023).

Children from underprivileged families in urban areas experience a significant gap in access to technology. Referring to previous studies, it appears that equal educational opportunities can help reduce this gap. This study explores digital inclusion strategies at the Al Ashriyyah Nurul Iman Foundation in Parung, Bogor, which provides free education for vulnerable children from underprivileged families in urban areas. A descriptive qualitative method was chosen to gain an in-depth understanding of the situation, with data collected through interviews with eight alumni and the head of the Islamic boarding school. To explore the data in depth and also as a form of triangulation, observation and document review were also carried out. After the data was collected, thematic analysis was conducted to identify patterns that emerged in the research results and highlight the urgency of digital skills training for vulnerable groups in today's technology-driven society.

There are notable distinctions between urban and migrant students attending public schools in terms of ICT access, use, and proficiency (Zhong et al., 2021). This implies that addressing this digital divide can be greatly aided by inclusive educational policies. The digital divide, however, varies depending on the urban setting. While migrant students in urban public schools may have access to digital resources similar to their urban peers, those attending private migrant schools often face a wider digital gap (Yang et al., 2013).

This emphasizes how crucial school type and quality are in tackling digital inequality. Furthermore, the gap includes digital literacy and skills in addition to access to technology. A study in Indonesia found that digital literacy among the urban poor is low. Certain groups, like younger people and females, lead in using digital tools (Mulyaningsih et al., 2021). The digital divide affecting disadvantaged children in urban areas needs a well-rounded approach. Providing equal access to technology and educational opportunities is essential. It is also important to improve digital literacy skills and ensure quality digital education in various schools. Policymakers and educators should consider factors like family background, school type, and the specific needs of disadvantaged groups to effectively close the digital gap and promote fair access to digital tools and skills.

Literature Review

To address educational inequality and as an effort to promote social justice, digital inclusion for children from underprivileged families in urban areas is very important. Research from (Betancur et al., 2024) shows that access to digital technology and the development of digital literacy skills can have a significant impact on children's academic achievement and future opportunities. The proliferation of private early childhood education centres (PAUD) in urban areas contributes to the achievement gap between economically disadvantaged children and their more affluent peers. Participation in PAUD, especially in private centres, has been shown to have an impact on academic achievement, suggesting that increasing access to quality PAUD can help close this gap. Community interventions that combine digital inclusion programmes and promotional events have been shown to be effective in increasing digital technology adoption among low-income urban residents. For example, a study in Austin, Texas, found that such interventions were the most significant factor in encouraging public housing residents to sign up for Google Fibre (Chen et al., 2021).

Successful digital inclusion strategies for vulnerable groups involve a multi-faceted approach. These include providing access to digital infrastructure, integrating digital literacy education, leveraging existing community networks, and adopting participatory approaches. Additionally, addressing the specific barriers faced by marginalized populations and fostering digital skills within and across communities are crucial elements in promoting digital inclusion. Digital inclusion strategies for vulnerable groups encompass a range of approaches aimed at bridging the digital divide and promoting equitable access to digital technology and skills. One key strategy is providing universal access to digital infrastructure and resources. This includes initiatives to supply digital devices and reliable internet connectivity to underserved communities, both in educational settings and at home (Adeleye et al., 2024). Additionally, establishing community centers or digital hubs can offer access to technology and support for digital literacy needs. Adeleye et al. (2024) suggests that integrating digital literacy education into curricula at all levels is another crucial approach, equipping students with the skills to navigate digital platforms and critically evaluate online information. Some strategies have focused on leveraging existing social networks and community structures. For instance, direct connections to existing networks that enable low-threshold access to vulnerable groups in everyday life have shown promise (Quilling et al., 2020). Participatory approaches involving the target group in planning and implementing digital inclusion initiatives have also been effective. Furthermore, the ethics of care perspective highlights how emotions such as empathy can trigger actions leading to the technological involvement of those on the digital periphery, particularly in tightly knit marginalized communities (Pavez et al., 2023).

This research was conducted at the Al Ashriyyah Nurul Iman Islamic Boarding School Foundation in Parung, Bogor Regency. This location was chosen because the Al Ashriyyah Nurul Iman Islamic Boarding School is an educational institution that has provided free education programmes for children from underprivileged families, ranging from early childhood education, primary school to university (bachelor's and master's degrees). This study attempts to understand the strategies implemented by the Nurul Iman Islamic Boarding School in promoting digital inclusion for its students, the majority of whom come from underprivileged families and live in urban areas. By analysing these strategies, this study is expected to provide valuable insights for policymakers, educators and community leaders to better support this vulnerable group. By facilitating its students, it is hoped that

more equitable opportunities will be created and their overall quality of life will be improved, especially after they complete their studies.

Methodology

This study aims to analyse the experiences of students from underprivileged backgrounds at Al Ashriyyah Nurul Iman who have graduated and received digital facilities in their learning, as well as to see how digital learning helps them prepare for the world of work. This study also looks at the views of policy makers at the institution regarding the digitisation process and its impact on students' readiness to face digital demands after graduation. The method used in this study is descriptive qualitative, as it is considered appropriate for exploring experiences and perceptions in depth. The research participants consisted of eight alumni, one leader, and two staff members, referring to Beck's (2021) guidelines. Participants were selected using purposive sampling to capture diverse experiences and backgrounds (Creswell, 2016).

Interviews, observations, and document analysis were conducted over a period of one month as a form of data collection and triangulation. Semi-structured interviews were conducted with alumni and institutional leaders to gain an in-depth understanding of their experiences with the digital policies implemented at Al Ashriyyah Nurul Iman and their impact on students after graduation. Observations were conducted within the institution to observe the implementation of technology, the use of digital platforms, and technology-based learning activities. In addition, document analysis was conducted on institutional policies, digital teaching materials, and reports related to the implementation of digitalisation to provide supporting context and strengthen the research results.

Data analysis was conducted comprehensively and repeatedly. After going through the transcription, coding, and categorisation processes, the main themes were extracted. Source triangulation was applied by combining data from interviews, observations, and documents to increase the validity of the findings. Through a process of iterative analysis, this study produced a comprehensive understanding of alumni's readiness to face digital demands and how digitalisation policies and implementation in institutions shape that experience.

Results

1. Digital Skills for Better Opportunities

The provision of the Al Ashriyyah Nurul Iman digital skills improvement programme has had a positive impact on students in terms of promoting digital inclusion. This programme has enabled most students from underprivileged families and the most vulnerable groups to enjoy equal rights in terms of digital access, thereby opening up more opportunities for decent employment as their skills improve, allowing them to develop their careers, pursue higher education and start digital-based businesses. Some skills, such as computer and internet operation, utilization of social media, and graphic design, have become added values possessed by alumni. In the context of increasingly rapid digital development, digital skills have become a crucial aspect for students at Al Ashriyyah Nurul Iman Islamic Boarding School. These skills are integrated into the curriculum as a preparation for entering the professional world. Furthermore, the program is designed to equip students with the ability to adapt and compete in the modern job market, which is shaped by rapid technological advancement.

“Digital skills greatly affect the readiness of students after graduation. Due to modern times where information technology is developing rapidly and is the main point in many activities, it is necessary to have sufficient provisions as well.” (Informant L)

“Digital skills acquired in islamic boarding schools are very important in preparing students to face the world of work and society. The ability to use computers, the internet, and social media helps them to adapt to technology so as to make students better prepared to face an increasingly digital and technology-based world of work.” (Informant MS)

The next option for alumni of Al Ashriyyah Nurul Iman Islamic Boarding School is to pursue further studies. In the digital era, information about educational opportunities is widely accessible via digital platforms. In order to access information on digital platforms, it is necessary for students to possess the requisite digital skills to operate digital devices. Through the digital skills program, the ability to access information about higher education is significantly enhanced. The expansion of access to information creates a broader range of possibilities for pursuing higher education of a superior quality. Furthermore, the initiated digital skills program also assists students in preparing for further education. students who have digital skills will more readily be able to access information about education, thereby increasing the likelihood of obtaining a quality higher education.

“Digital skills are very helpful for alumni in achieving their career or education goals. For example, alumni can access information about higher education programs and apply online.” (Informant MS)

The accelerated growth of the digital economy in Indonesia has prompted some alumni to pursue entrepreneurship. E-commerce and digital payments are digital innovations that facilitate entrepreneurship. Digital skills enable the optimization of these platforms, thereby expanding the market and increasing the availability of services. The digital skills acquired during one's tenure at the boarding school are instrumental in the development of digital-based products and services.

“It is very influential because nowadays everything is using digitized media, especially the world of work in the entrepreneurial field is very supportive of social media to increase the market.” (Informant I)

2. Beyond for Better Opportunities

Enhancing Personal Capabilities

The availability of digital skills programmes at AlAshriyyah Nurul Iman provides students with the opportunity to face the challenges of a digital future more effectively. Students are expected to improve their digital skills during their studies, which will not only make it easier for them to find employment but also enable them to perform their jobs professionally.

“The digital skills obtained from islamic boarding school for social life are very impactful more specifically when entering the world of work where more digital skills are needed, for example from myself as an administrator in Madrasah Ibtidaiyah.” (Informant AB)

“Digital skills help alumni in carrying out professional tasks, such as communicating with clients, managing projects, and promoting businesses.” (Informant MS)

“Significantly increased self-confidence. When we are proficient in using technology, we feel more capable and independent in facing various challenges” (Informant S)

“I am very confident. Alhamdulillah, I have learned about the digital world in the hut. So, when I came out, I wasn’t surprised anymore.” (Informant NK)

The ability to access digital platforms is also employed by alumni for the purpose of enhancing their learning capabilities. The Internet provides access to a virtually limitless array of knowledge, opportunities, and resources. Digital platforms provide access that is not constrained by temporal or spatial limitations. Such platforms afford users the ability to learn any subject from any location at any time. Some alumni employ this access to obtain knowledge that will facilitate their future careers.

“Very helpful. Digital skills allow me to access information more easily, communicate effectively with various parties, and develop myself through online learning. This all supports me in achieving my career goals.” (Informant S)

“With this program, students and alumni are more updated, can learn independently, and get learning resources that were previously difficult to access. So, there is no reason not to learn or find out new things.” (Informant AK)

Moreover, the digital skills program has facilitated the involvement of students and alumni in a multitude of self-development activities conducted online, including courses, webinars, and distance learning. Such participation also encourages digital inclusion, ensuring that all groups have access to the same benefits of digital technology, including students and alumni.

“The digital inclusion program has a significant positive impact on access to information and learning opportunities for students and alumni. students and alumni can access wider and more diverse information through the internet, including news, books, journals, and other learning resources. Digital inclusion programs open up opportunities for students and alumni to join online courses, webinars, and distance learning programs. Digital skills help students and alumni to develop themselves, both in terms of knowledge, skills and creativity.” (Informant MS).

Networking and Interaction with Society

Currently, connectivity between individuals is becoming easier due to the development of digital platforms. Digital platforms open up access and opportunities to expand networks beyond geographical boundaries. Initiatives and possibilities for collaboration are increasingly open with the existence of digital platforms. This potential is also utilised by students and alumni of Islamic boarding schools to expand their networks, enabling students to access new opportunities and experiences that are beneficial for their personal and professional growth. More than that, digital skills can facilitate and encourage more active self-expression in communities.

“Social media and other digital platforms allow students to build networks and establish relationships with people from various backgrounds.” (Informant MS)

“Very important. Digital skills help me collaborate with others, manage professional networks, and promote myself. This is very useful in carrying out social and professional activities.” (Informant S)

“Digital skills make it easier for alumni to connect with others and build networks. Whether for social activities, creating communities, or professional activities such as finding clients or collaborations. With social media and other digital platforms, alumni can express themselves more freely and expand their relationships.” (Informant AK)

Human lifestyles have changed significantly since the development of technology. Digital platforms have become an integral part of various aspects of human life, from basic needs to government services. In this context, digital skills are essential for participating in community activities that are increasingly digital-based. For alumni, digital skills have been instrumental in their ability to integrate into society after graduating from the boarding school. Additionally, these skills facilitate adaptation to changes in community behavior due to the dynamic development of digital technology.

“I consider the role of these skills to have many positive sides, especially for integration into society.” (Informant I).

“Digital skills are like mandatory provisions, especially in this digital age. students are better prepared to adapt to the outside world, whether for work or just interacting. Many things now can be done from a smartphone or laptop, so this ability is very helpful for them to immediately connect when they enter the community.” (Informant AK)

3. The Harmonization of Religion and Technology

In general, the stigma associated with Islamic boarding schools is that they adhere to a strict religious tradition. Such values are to be observed and eschewed as a matter of obedience to God. One aspect of Islamic boarding schools is the restriction or even prohibition of students interacting with new values, such as technological advances. The general perception that has been circulating is that such boarding schools only focus on Islamic studies. Some boarding schools even believe that technological advances have the potential to disrupt the religious learning process and cause behaviour that is prohibited by religion. Although gadgets are prohibited for individual use, Al Ashriyyah Nurul Iman provides various facilities that support learning and strives to balance the learning process of religious knowledge and technology and seeks to instil various skills in line with the demands of the modern era. The acquisition of digital skills is a crucial aspect of this endeavor, and when coupled with a solid grounding in religious knowledge, it fosters a harmonious integration into the digital landscape.

“It can really overcome equality. Even though we are based on Islamic boarding school, which is religious, we can prove that we can also compete with those out there who have learned technology.” (Infomant NK)

“What is taught in the Islamic boarding school, especially for digital skills, is very supportive because the facilities in the Islamic boarding school currently do exist... And if the students accept what the Tik teacher says and immediately practice, the students can

overcome the challenges of inequality experienced by the students before entering the Islamic boarding school.” (Informant I)

Discussion

The digital inclusion strategy at Al Ashriyyah Nurul Iman Islamic Boarding School for students from disadvantaged families is through a digital skills training program. These skills become a “bridge” for students to reach better opportunities in the aspects of career, further education, and entrepreneurship. Digital skills are also able to improve individual capabilities, social networks, and interaction with the community. With this program, boarding schools do not only focus on teaching religion, but also prepare students for the growing challenges, one of which is the development of information and communication technology when boarding schools are identified with restrictions on technological devices (Diaz et al., 2013).

With digital skills, boarding schools have helped alumni to be more competitive in various fields and thus get better opportunities in fields such as technology, education, administration, and business (Meier et al., 2025). These skills enable them to not only find jobs, but also improve their performance in the workplace, both as professionals and entrepreneurs (Bergholz et al., 2024). In addition, alumni who continue their studies are helped by the digital skills they have acquired in Islamic boarding school. Digital skills are an important element in supporting educational aspirations in the modern era, even if they come from the world of Islamic boarding school (Narlock et al., 2021). Armed with digital literacy skills, they can easily access information about scholarships available after graduation and utilise online resources to support the learning process. In fields such as entrepreneurship, digital skills help alumni market their products in online marketplaces, enabling them to reach a wider market. Mastery of digital platforms provides a competitive advantage, especially in a business world that is increasingly dependent on digital technology (Cheng et al., 2024; Lungu & Georgescu, 2024).

Among the benefits of digital literacy for them is improved individual competence. As graduates of Islamic boarding schools, they are not only proficient in religious knowledge but also able to keep up with technological developments. One alumnus stated that the digital skills he acquired in his previous education (while still at Al Ashriyyah Nurul Iman) were a significant advantage when entering the workforce. They also find it easy to access diverse information and opportunities that support their professional and academic development. Additionally, digital skills foster confidence in facing the challenges of the digital age. Ultimately, digital skills not only provide technical expertise but also crucial personal competencies (Cohen & Gal, 2024). Digital skills are also important for expanding networks and interactions. These skills enable students to utilise social media platforms to build relationships, exchange information, and participate in various virtual communities that can help bridge the gap between online and offline interactions and potentially lead to more meaningful social experiences (Abderrahmen & Harras, 2010). Thus, digital skills will become increasingly important for effective and constructive social engagement.

Al Ashriyyah Nurul Iman Islamic Boarding School is one example of an Islamic boarding school that has transformed to meet the demands of the digital age while retaining its traditional religious focus. In addition to offering free education, this Islamic boarding school also recognises the importance of providing comprehensive education that encompasses religious knowledge and modern technical skills, with the aim of encouraging students to become independent individuals after graduation. In some respects, the modernisation of Islamic boarding schools through the adoption of technology has posed

challenges in fulfilling their primary function, which is to produce *tafaqquh fiddin* (people who are deeply knowledgeable about religion) (Shofiyyah et al., 2019). However, many Islamic boarding schools are trying to be adaptive and find ways to balance traditional values with technological advances, such as offering information technology courses to students (Niswah et al., 2024).

Digital skills programmes have proven to be a facility for social empowerment. If continuously improved and given adequate support, these programmes have the potential to encourage educational innovation that integrates religion, technology and social development. This is in line with the goal of the majority of Islamic boarding schools to develop a generation that is not only proficient in religious knowledge but also ready to compete in the contemporary global context.

Conclusions

The digital skills program implemented by Al Ashriyyah Nurul Iman Islamic Boarding School has shown a good impact on its alumni in facing global challenges. This program is part of the school's efforts to provide inclusive access to knowledge, especially digital knowledge. The majority of students are part of vulnerable groups who come from disadvantaged families. By improving digital skills, students from disadvantaged families can increase access to information, individual capabilities, and expand their networks. As a result, through the program, students who previously had limited access to digital knowledge became better prepared to face the rapid advancement of ICT. However, this program faces several challenges such as the availability of adequate technology infrastructure and the improvement of the quality of digital training that is still limited. Partnership cooperation to encourage digital equity with various parties also needs to be pursued in order to have a sustainable program.

Thus, the digital skills program in this institution functions as a transformational force that prepares students and alumni to contribute according to technological developments in the midst of society, especially in urban areas. Increasing digital skill not only improves technical skill, but also, it helps achieve more opportunities, increase capabilities, build confidence, expand social networks and facilitate interaction with society.

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References

- Abderrahmen, M., & Harras, K. (2010). Exploiting social interactions using opportunistic networks. 2010(1), *CSO10*. <https://doi.org/10.5339/qfarf.2010.CSO10>
- Adeleye, O. O., Eden, C. A., & Adeniyi, I. S. (2024). Educational technology and the digital divide: A conceptual framework for technical literacy inclusion. *International Journal of Science and Research Archive*, 12(1), 150–156. <https://doi.org/10.30574/ijrsra.2024.12.1.0405>
- Andako, O. O. (2023). Navigating the path to economic empowerment: Overcoming challenges in digital platforms for economic empowerment. *World Journal of*

- Advanced Research and Reviews*, 20(3), 1503–1521.
<https://doi.org/10.30574/wjarr.2023.20.3.1450>
- Beck, C. T. (2021). *Introduction to Phenomenology: Focus on Methodology*. SAGE Publications, Inc. <https://doi.org/10.4135/9781071909669>
- Bergholz, C., Fünér, L., Lubczyk, M., Sternberg, R., & Bersch, J. (2024). Infrastructure required, skill needed: Digital entrepreneurship in rural and urban areas. *Journal of Business Venturing Insights*, 22, e00488. <https://doi.org/10.1016/j.jbvi.2024.e00488>
- Betancur, L., Miller, P., & Votruba-Drzal, E. (2024). Urban-rural achievement gap in low- and middle-income countries: The role of early childhood education. *Early Childhood Research Quarterly*, 66, 11–23. <https://doi.org/10.1016/j.ecresq.2023.08.008>
- Chen, W., Li, X., Huang, G., & Straubhaar, J. (2021). If you built a sandbox: How children, network diversity, and community interventions are related to Google Fiber signup in disadvantaged urban communities. *Telematics and Informatics*, 60, 101580. <https://doi.org/10.1016/j.tele.2021.101580>
- Cheng, C., Gao, Q., Ju, K., & Ma, Y. (2024). How digital skills affect farmers' agricultural entrepreneurship? An explanation from factor availability. *Journal of Innovation & Knowledge*, 9(2), 100477. <https://doi.org/10.1016/j.jik.2024.100477>
- Cohen, Y., & Gal, H. C. (2024). Digital, Technological and AI Skills for Smart Production Work Environment. *IFAC-PapersOnLine*, 58(19), 545–550. <https://doi.org/10.1016/j.ifacol.2024.09.269>
- Creswell, J. W. (2016). *Research design: Pendekatan metode kualitatif, kuantitatif, dan campuran* (A. Fawaid & R. K. Pancasari, Trans.; Empat). Pustaka Pelajar.
- Díaz, M., Roncancio, M., Gomez-Sarmiento, M., & Duque, M. (2013). Impact of inquiry science and technology education in the development of citizenship skills: The case of the Pequeños Científicos program in Colombia. *2013 IEEE Integrated STEM Education Conference (ISEC)*, 1–4. <https://doi.org/10.1109/ISECon.2013.6525196>
- Domínguez Castillo, J. G., Cisneros Cohernour, E. J., Suaste Escalante, M. A., & Vázquez Carrillo, I. D. S. (2019). Reducing the Digital Divide in Vulnerable Communities in Southeastern Mexico. *PUBLICACIONES*, 49(2), 133–149. <https://doi.org/10.30827/publicaciones.v49i2.9305>
- Flaskerud, J. H., & Winslow, B. J. (1998). Conceptualizing Vulnerable Populations Health-Related Research. *Nursing Research*, 47(2), 69–78. <https://doi.org/10.1097/00006199-199803000-00005>
- Lungu, A. E., & Georgescu, M. R. (2024). Digital Entrepreneurship: An empirical Approach on Students' Perceptions and Attitudes. *Procedia Computer Science*, 237, 544–551. <https://doi.org/10.1016/j.procs.2024.05.138>
- Meier, A., Eller, R., & Peters, M. (2025). Creating competitiveness in incumbent small- and medium-sized enterprises: A revised perspective on digital transformation. *Journal of Business Research*, 186, 115028. <https://doi.org/10.1016/j.jbusres.2024.115028>
- Mulyaningsih, T., Wahyunengseh, R., & Hastjarjo, S. (2021). Poverty and Digital Divide: A Study in Urban Poor Neighborhoods. *Jurnal Ilmu Sosial Dan Ilmu Politik*, 24(2), 189. <https://doi.org/10.22146/jsp.52325>
- Narlock, M., Johnson, D., & Vecchio, J. (2021). Digital preservation services at digital scholarship centers. *The Journal of Academic Librarianship*, 47(3), 102334. <https://doi.org/10.1016/j.acalib.2021.102334>
- Neugebauer, J. (2024). Economic Barriers as a Large Part of the Problem with Access to Healthcare. *3rd Proceedings of the Open Scientific Conference 2024*, 41–50. <https://doi.org/10.52950/4OSC-Athens.2024.8.004>
- Niswah, S., Asiyah, N., Nasikhin, N., & Wahyudi, W. (2024). TECHNOLOGY-BASED EDUCATION MANAGEMENT IN SALAF ISLAMIC BOARDING SCHOOLS. *Evaluasi:*

- Jurnal Manajemen Pendidikan Islam*, 8(2), Article 2.
<https://doi.org/10.32478/pzx84n77>
- Olsen, W. (2012). *Data Collection: Key Debates and Methods in Social Research*. SAGE Publications Ltd. <https://doi.org/10.4135/9781473914230>
- Pavez, I., Correa, T., & Farías, C. (2023). The Power of Emotions: The Ethics of Care in the Digital Inclusion Processes of Marginalized Communities. *Social Inclusion*, 11(3). <https://doi.org/10.17645/si.v11i3.6623>
- Quilling, E., Kuchler, M., Leimann, J., Dieterich, S., & Plantz, C. (2020). Strategies for reaching vulnerable groups in municipal health promotion. *European Journal of Public Health*, 30(Supplement_5), ckaa165.1355. <https://doi.org/10.1093/eurpub/ckaa165.1355>
- Shofiyyah, N. A., Ali, H., & Sastraatmadja, N. (2019). Model Pondok Pesantren di Era Milenial. *BELAJEA: Jurnal Pendidikan Islam*, 4. <https://doi.org/10.29240/belajea.v4i1.585>
- Xu, J., Takahashi, M., & Li, W. (2023). Identifying Vulnerable Population in the Urban Society: A Case Study of Wuhan, China. *NHESS - Natural Hazards and Earth System Sciences*. <https://doi.org/10.5194/nhess-2022-277>
- Yang, Y., Hu, X., Qu, Q., Lai, F., Shi, Y., Boswell, M., & Rozelle, S. (2013). Roots of Tomorrow's Digital Divide: Documenting Computer Use and Internet Access in China's Elementary Schools Today. *China & World Economy*, 21(3), 61–79. <https://doi.org/10.1111/j.1749-124X.2013.12022.x>
- Zhong, B., Zhu, F., & Xia, L. (2021). Is There a Digital Divide Between Urban Students and Migrant Students in China? *Sage Open*, 11(2), 21582440211016387. <https://doi.org/10.1177/21582440211016387>