PANTAO
International Journal of the Humanities and Social Sciences
ISSN 3028-0877
Volume 3, Issue 2 (2024)

Educational facilities cross evaluation in compliance with Sustainable Development Goals 4.A.1

Jomar Petilo
Teacher III, Queens Row Elementary School
City of Bacoor, Cavite
Philippines
Email: jomar.petilo@deped.gov.ph

Abstract: The Sustainable Development Agenda 2030 promotes healthy, inclusive, and sustainable communities through equitable, lifelong, and high-quality education. The UN's SDG 4a.1 evaluates schools' electricity, internet connectivity for education, computers, disabled facilities, clean drinking water, gender-segregated sanitation, and basic handwashing facilities. District III, Bacoor, Cavite schools received a two-star Three-Star Approach for Water, Sanitation, and Hygiene (WASH) in Schools rating after an assessment found shortcomings in WASH services. Additionally, the computer-to-student ratio is low, making classroom use difficult. School closures due to poor infrastructure emphasize the need for safe and satisfactory educational facilities to improve teaching and learning, in line with SDG 4. To address these concerns, study examined educational facilities' SDG 4.a.1 compliance, concentrating on 2030 goals. Descriptive research was used to cross-evaluate educational facilities in District III, Bacoor, Cavite, in 2022–2023. Selected administrators and teachers with facility management knowledge participated. Study analyzed electricity, internet, computers, classrooms, drinking water, handwashing facilities, and safety using the PDSA cycle. Facility management was hampered by limited infrastructure, resources, and budget. Based on findings, a development strategy was created to improve educational facilities and SDG 4.a.1 compliance, emphasizing the need for government and stakeholder participation.

Keywords: SDG 4A1, Three-Star Approach, WASH, PDSA

Date Submitted: April 15, 2024
Date Accepted: May 9, 2024
Date Published: May 18, 2024

INTRODUCTION

The Sustainable Development Agenda 2030 emphasizes inclusivity and high-quality education for all, with Sustainable Development Goal (SDG) number 4 aiming to provide lifelong learning opportunities. In line with this, the Department of Education (DepEd) of the Philippines aligns its initiatives with SDG 4.A.1, focusing on creating conducive learning environments by improving educational facilities. Key improvements include ensuring access to electricity, internet, computers, infrastructure for students with disabilities, drinking water, sanitation, and handwashing facilities.

Despite progress, challenges remain, such as inadequate facilities in India and the Philippines. In India, many schools lack essential infrastructure, electricity, and hygiene facilities. In the Philippines, insufficient investment in educational facilities impacts student learning outcomes, with many schools lacking electricity and potable water.

The provision of an appropriate learning environment that is most favorable to efficient teaching and learning is the main duty of educational institutions. It must adapt to shifts in instructional strategies and school structure while taking into account how the educational process has changed to become more dynamic, interconnected, and integrated into the larger community. In District III, City of Bacoor, Cavite, all schools are mandated to provide quality education and promote progressive leadership. It has a total of 7 schools with 625 teachers, 49 non-teaching staff and 23,649pupils found where they all utilized the numerous facilities and equipment. Based on National School Building Inventory (NSBI) 2023 report,

District III, City of Bacoor, Cavite faces challenges encountered in the management related to its educational facilities, which includes insufficient classrooms, shortage of sanitation facilities maintenance of buildings.

The government of the Philippines has allocated funds towards construction endeavors aimed at enhancing educational facilities with the objective of tackling this issue. For instance, schools that lacked these facilities, the government-built classrooms, fixed water systems, and supplied electricity. Nevertheless, some experts contended that the government is not doing enough to address the scope of the issue despite their efforts. They emphasized the necessity to increase educational spending, especially in rural regions, to guarantee that all children have access to high-quality instruction.

Furthermore, an organized facility management through cooperative activity among school administrators, faculty, non-teaching personnel, and students can be extremely beneficial. Educational facility should be viewed as valuable knowledge that can be measured and used to reduce facility deterioration.

This strengthened the researcher's motivation to look into the Bacoor III District, Division of Bacoor City policy of keeping an eye on and assessing educational facilities in order to build a program to improve facility management. The results of this study could help school administrators make improvements to their facilities, which would enhance the effectiveness and efficiency of delivering high-quality instruction. The future of educational institutions in the Philippine is promising, and the unwavering dedication to progress guarantees the continual growth of learning possibilities for future generations.

Statement of the problem

The study focused on educational facilities cross evaluation in compliance with Sustainable Development Goals (SDG) 4.a.1.The indicators measured the access in schools to main basic facilities and services needed to make sure a safe and effective learning conditions and environment for all students. Specifically, the study sought to answer the following questions:

1. What is the assessment of the respondents on the status of the school’s educational facilities in terms of electricity, internet access, computer access, classrooms, basic drinking water, basic hand washing facilities, and school safe learning facilities?
2. What is the assessment of the respondents on the school’s educational facilities compliance with the SDG 4.A.1in terms of electricity, internet access, computer access, classrooms, basic drinking water, basic hand washing facilities, and school safe learning facilities?
3. What issues and challenges are encountered by the school in managing school plant and facilities?

LITERATURE REVIEW

Challenges on educational facilities in the Philippines

The Philippine Institute for Development Studies (PIDS, 2023) states that inadequate facilities and resources in many schools, particularly in rural regions, are a significant problem for the country's educational system. This is a pervasive issue that impacts a large portion of the nation's schools.

According to a report from the Department of Education, there are about five thousand (5,000) institutions in the Philippines that do not have access to electricity, and approximately ten thousand (10,000) schools that do not have access to clean water. This lack of basic amenities has a detrimental effect on the quality of education received by both pupils and educators. Furthermore, a lot of schools don't have enough teaching resources, textbooks, or

classrooms, which makes it difficult for pupils to learn. This problem is not exclusive to rural regions; it also exists in cities.

A shortage of assets and facilities in schools exerts a significant influence on the caliber of education pupils get. Inadequate infrastructure may hinder students' ability to concentrate on their academics or prevent them from attending classeson a regular basis due to outside distractions. Lack of teaching resources, such as textbooks, makes it more difficult for pupils to learn since they do not have access to the knowledge needed to comprehend the subject covered in class.

The Philippine government has recognized the need to improve school facilities and has taken action by investing in infrastructure projects. In fact, they have directly tackled the issue by building classrooms, repairing water systems, and providing electricity to schools that previously lacked these essential resources. Additionally, the Department of Education has implemented the K-12 program, aimed at equipping students with a globally competitive education. This comprehensive initiative includes free textbooks, improved school facilities, and teacher training to ensure the success of students.

In recent years, the government has taken significant steps towards improving education in rural communities. One of these efforts is the Alternative Learning System (ALS), which provides non-formal education to children and adults who are unable to attend traditional schools. The ALS aims to equip learners with basic literacy and numeracy skills, as well as practical life skills. This initiative is crucial in ensuring that every citizen in the Philippines has equal opportunities for a fundamental education.

Despite the government's efforts, there are experts who argued that they are not adequately addressing the issue at hand. These experts highlight the importance of investing more in education, particularly in rural areas, to guarantee that everybody or every pupilowns a chance at exceptional education. In the study conducted by Philippine Institute for Development Studies (PIDS) in year 2023 supports this argument, showing a strong correlation between education and poverty reduction. This study suggests that providing more educational opportunities can lead to better career opportunities and higher income, ultimately leading to a decrease in poverty levels.

Additionally, a multitude of developing countries, including the Philippines, are faced with the common challenge of inadequate resources and facilities in their education systems. This issue extends beyond the Philippines, as exemplified by the dire situation in sub-Saharan Africa where approximately 30 million children of primary school age are not receiving an education. Those who are fortunate enough to attend school often face similar obstacles to those faced by Filipino children. These obstacles include a lack of basic necessities such as clean water, electricity, and adequate classrooms.

Infrastructure plays a crucial role in the education sector, and several studies have examined its impact on student outcomes. Navarro (2022) conducted a study in the Philippines, which found that the availability of basic amenities and services like clean water, power, drainage, sports facilities, labs, libraries, books, and computers in schools positively influenced the academic performance of primary school pupils in language and mathematics exams. Barrett et al. (2019) conducted a comprehensive review of educational infrastructure design and its impact on student outcomes, highlighting the strong evidence supporting the positive effects of school planning and design on health, academic development, and the alignment between pedagogy and school environments.

In the context of electrification, energy poverty has been a subject of increasing discussion. Kocak & Oralhan (2023) focused on the economic dimensions of energy poverty, revealing that the lack of energy resources in schools leads to a significant reduction in teaching resources and classroom materials, limiting the quality of education provided to students. Mejdalani et al. (2018) found that increased electrification in rural schools in Brazil

was associated with reduced dropout rates and improved gender equity in terms of enrolment. Similarly, Alam and Kaneko (2019) highlighted the favorable impact of electrical energy access with academic advancement also with appearance of the students. However, some studies have found mixed results, indicating that effects of electrical power in study hours and admission may vary depending on the context (Nitter, 2022).

With the employment of ICT(Information and Communication Technologies) in education has seen substantial growth in recent years. Various studies have examined the relationship between ICT usage and student academic performance. Diaz et al. (2019) and Youssef et al. (2022) found positive changes in student performance when ICT tools were used for browsing the internet and completing school work. Ferraro (2018) observed optimistic impact of information technology usage to examination results in mathematics. Nevertheless, Gutiérrez (2020) discovered that the influence of ICT on academic achievement differed according on the specific subject and the way technology was utilized. The study emphasized the need for careful evaluation and consideration of specific fields and methods of ICT use in educational policies to maximize positive effects.

When considering Sustainable Development Goal 4 (SDG 4) regarding quality education, Elfert (2019) brought to light the obstacles faced in promoting adult education caused by inadequate funding from both domestic and international sources. Expounding on the impacts of Goal 4, Foreign Affairs Secretary Manalo emphasized the alarming rise in elementary and high school student dropouts in the Philippines (Brago, 2022). Moreover, Villegas (2021) shed light on the concerning levels of illiteracy among children in the Philippines and advocated for equal opportunity for excellent preschool developmental and primary schooling.

In addition, WASH (water, sanitation, and hygiene) facilities educational institutions are crucial for health and well-being of students. Studies have shown that inadequate WASH facilities lead to water-borne illnesses, high medical costs, decreased economic output, and increased absenteeism. Providing effective WASH facilities, including toilets, has been found to increase attendance and reduce dropout rates (Bio Loo, 2022; Sharma & Adhikari, 2022).

In conclusion, research in infrastructure emphasizes the positive impact of basic amenities and services on student performance, the importance of electrification for reducing dropout rates and improving gender equity, the potential of ICT for enhancing learning outcomes with careful consideration of context and usage, and the need to address water, sanitation, and hygiene issues to improve attendance and reduce illnesses. These findings highlighted the significance of infrastructure improvement in promoting quality education and addressing the Sustainable Development Goals.

METHODOLOGY

Research Design

The study employed the method of descriptive research method to facilitate the presentation as well as evaluation of the research. The study presented the educational facilities cross evaluation in compliance with Sustainable Development Goals (SDG) 4.a.1.in selected elementary schools in District III, City of Bacoor Cavite during school year 2023-2024.

Following the Plan-Do-Study-Act (PDSA) cycle, the study assessed the status of the educational facilities of the selected elementary school based on the following indicators: electricity, internet access, computer access, number of classrooms, basic drinking water, basic hand washing facilities, and school safe learning facilities.

Locale and Population

The study was conducted in selected elementary schools in District III, City of Bacoor, Cavite. The study focused on the three selected elementary schools with a total population of 15,241 students at the time of the conduct of this study. Despite being mega schools, these institutions faced challenges related to its educational facilities, including insufficient classroom space, shortage of sanitation facilities, maintenance of buildings based on NSBI 2023 report.

The researcher used purposive sampling in the selection of the respondents of the study from. A total of 23 school administrators and 416 teachers were identified and invited to become participants of this study.

Data Gathering Procedures

The researcher obtained permission from the school division superintendent to conduct the study. After receiving approval from the, the researcher sent request letters to the school principals for data gathering approval. With the assistance of master teachers, the survey instrument was distributed to school administrators and teachers. A separate focus group discussions were scheduled with school administrators to identify issues and challenges in managing educational facilities, during which administrators were interviewed for their honest feedback. The school principals directed comments from students and parents to the administrators and teachers.

Research Instrument

A researcher-made questionnaire served as the data gathering instrument. The questionnaire consisted of two sets of survey instrument: The first instrument was the school's instrument used to determine the status of the school educational facilities in terms of: electricity, internet access, computer access, number of classrooms, water indicator, basic hand washing facilities, and school safe learning facilities condition.

The second instrument used was to determine the compliance of the school facilities with SDG 4.a.1 in terms of: electricity, internet, computer, adapted infrastructure and materials for students with disabilities, basic drinking water, single-sex basic sanitation facilities, and basic hand washing facilities.

A structured interview guide was utilized throughout the group discussion to ascertain the specific concerns and difficulties faced by this institution in successfully handling its physical structures and amenities.

The researcher presented the survey instrument for validation to a group of experts: three school heads, five mathematic teachers, and five English teachers. The school principals reviewed the items to determine the correctness of each criteria used in the instrument based on school's data and SDG 4.A.1.

Data Analysis

Descriptive Statistics was used to summarize or describe the characteristics of a data set. This may include measures such as frequencies, percentages, and means. These measures provide a basic understanding of the data distribution and characteristics (Hayes, 2023). The indicator measures access in schools to key basic services and facilities necessary to ensure a safe and effective learning environment for all students. A Likert-type scale questionnaire was applied to analyze data statistically, (Jackson, SL. 2009). A school with high rating signifies that it possess exceptional access to the requisite facilities and services. It is optimal for every school to have access to a comprehensive array of these resources and amenities.

FINDINGS OF THE STUDY

Respondents' assessment on the status of the educational facilities

The two groups of respondents, the school administrators and teachers from the three selected schools from District III, City of Bacoor, Cavite indicated limited access or average level of educational facilities.

In terms of electricity access, school administrators and teachers indicated limited access to electricity, with mean scores as follows: School 1 (2.00 administrators, 2.20 teachers), School 2 (2.30 administrators, 2.20 teachers), and School 3 (2.10 administrators, 2.25 teachers). Issues of unstable electricity and voltage fluctuations were prevalent, leading to disruptions, loss of information, and potential damage to sensitive equipment.

As to internet access, poor internet access was consistently reported, with mean scores showing: School 1 (1.65 administrators, 1.60 teachers), School 2 (1.55 administrators, 1.50 teachers), and School 3 (1.66 administrators, 1.50 teachers). Meanwhile, in terms of computer Access, limited computer access was another significant issue, with mean scores indicating: School 1 (2.33 administrators, 2.00 teachers), School 2 (2.30 administrators, 1.80 teachers), and School 3 (2.20 administrators, 1.85 teachers). Despite efforts by the Department of Education (DepEd) to enhance ICT tools through the DepEd Computerization Program, challenges remain.

When classroom availability was considered, both groups agreed on the inadequate number of classrooms, with mean scores showing: School 1 (1.66 administrators, 1.50 teachers), School 2 (1.67 administrators, 1.60 teachers), and School 3 (1.66 administrators, 1.50 teachers). Insufficient infrastructure, particularly in remote areas, combined with rising enrollment, underscores the need for additional classrooms. Meanwhile, in terms of basic drinking water, administrators reported limited or average levels of basic drinking water services, while teachers indicated poor levels, with mean scores of: School 1 (1.67 administrators, 1.50 teachers), School 2 (1.69 administrators, 1.60 teachers), and School 3 (1.80 administrators, 1.66 teachers).

Looking into the hand washing facilities, both groups indicated limited hand washing facilities, with mean scores showing: School 1 (2.30 administrators, 2.33 teachers), School 2 (2.30 administrators, 2.26 teachers), and School 3 (2.33 administrators, 2.30 teachers). Considering safe learning facilities, administrators reported limited or average levels, while teachers indicated poor levels of safe learning facilities, with mean scores of: School 1 (2.00 administrators, 1.60 teachers), School 2 (1.70 administrators, 1.55 teachers), and School 3 (2.30 administrators, 1.55 teachers).

Navarro (2022) emphasized that a good learning environment is crucial for better student outcomes and future worker productivity, contributing to human capital development and economic growth. Navarro pointed out significant deficiencies in WASH infrastructure and the lack of electricity in many Philippine schools. There is also a notable gap in access to ICT tools, with Philippine schools lagging behind neighboring countries. Navarro also suggested that the public-private partnership (PPP) approach could be reconsidered to meet future demands for school infrastructure, stressing the need for a thorough evaluation of investment and financing opportunities.

Respondents' assessment on the school's educational facilities compliance with the SDG 4.A.1

When the respondents insights were considered on the school's educational facilities compliance with the SDG 4.A.1, in terms of the compliance of school facilities with SDG

4.A.1, both school administrators and teachers from the three selected schools in District III, City of Bacoor, Cavite, indicated significant non-compliance across various areas.

When electricity is considered, the mean scores for both groups suggested non-compliance with electricity requirements, with school administrators scoring an average of 1.53 and teachers scoring 1.45. These scores highlight the absence of regular and readily available power sources necessary for sustainable use of ICT infrastructure. Similarly, non-compliance was observed regarding internet access for enhancing teaching and learning, with school administrators averaging 1.60 and teachers averaging 1.58. These scores indicate that the internet was not readily accessible for educational purposes. Both groups also reported non-compliance concerning computer access for facilitating course delivery or autonomous teaching and learning. School administrators scored an average of 1.43, while teachers averaged 1.52. These scores suggest issues with utilizing computers effectively for educational purposes.

When adapted infrastructure and materials for students with disabilities is considered, the study revealed non-compliance with providing adapted infrastructure and materials for students with disabilities, with school administrators averaging 1.60 and teachers averaging 1.50. These scores suggest limitations in making educational facilities and materials accessible to all users.

On the other hand, views varied on compliance with providing basic drinking water, with indications ranging from limited to non-compliance. School administrators averaged 1.76, while teachers averaged 1.62, pointing to challenges in ensuring a practical source of potable water easily accessible during school hours.

Meanwhile, Non-compliance was evident in providing separate sanitary facilities for males and females, with school administrators averaging 1.55 and teachers averaging 1.53. These scores highlight the necessity for designated facilities on school premises. While compliance varied, there were indications of limited accessibility to basic handwashing infrastructure equipped with soap and water. School administrators averaged 2.00, while teachers averaged 1.67, reflecting challenges in providing adequate hygiene facilities for all users.

The results indicated significant non-compliance with SDG 4.A.1 requirements across multiple facets of educational facilities, including electricity, internet access, computer availability, facilities for students with disabilities, drinking water, sanitation, and handwashing. In a broader context, the article delves into the implementation of the Sustainable Development Goals (SDGs) and their interconnectedness. It underscores the importance of assessing progress towards achieving SDG 4 - Quality education, within the broader framework of the 2030 Agenda. Despite notable advancements, challenges persist, particularly in areas like technology integration, environmental sustainability, and equitable access to education, highlighting the need for concerted efforts to address these issues and ensure quality education for all.

Issues and challenges encountered by the school in managing school plant and facilities

The Philippine education system grapples with a pressing issue: the unequal distribution of educational resources, encompassing teaching materials, digital technology, teacher training, and infrastructure, among others. This issue is particularly acute in rural areas, such as District III, City of Bacoor Cavite, where educators witness firsthand the detrimental effects of inadequate facilities on students' learning experiences. The scarcity of classrooms, lack of libraries, and outdated facilities create an environment that impedes effective teaching and learning. Students in rural areas bear the brunt of these challenges, facing barriers to accessing essential resources like electricity and clean water.

To better understand these challenges, school administrators and teachers were interviewed to solicit their insights. Through focus group discussions, common issues emerged regarding educational facilities, which were further examined through a survey instrument aligned with SDG 4.a.1. This ensured a comprehensive assessment of the facilities' compliance with global education standards.

The responses from school administrators and teachers highlighted various issues, including limited electricity supply, unstable internet connectivity, insufficient computer availability, inadequate infrastructure for students with disabilities, and challenges related to basic amenities like drinking water and sanitation facilities. These challenges impact the overall learning environment, hindering students' ability to thrive academically.

School administrators also expressed challenges in managing educational facilities, citing issues such as outdated electric wiring, restricted internet access, insufficient computer resources, and overcrowded classrooms. These difficulties are exacerbated by budget constraints and limited support from government agencies like DepEd.

Despite these challenges, the study emphasizes a proactive approach to address current concerns and develop a resilient education system capable of driving long-term growth and progress. By identifying and addressing the root causes of these issues, stakeholders can work towards creating an inclusive and conducive learning environment for all students, regardless of their geographical location or socioeconomic status.

Future directions of educational facilities development

The results of the assessment revealed significant non-compliance of school educational facilities with SDG 4.A.1 across all indicators, including electricity, internet access, computer availability, infrastructure for students with disabilities, basic water supply, and sanitation facilities. Issues such as inadequate electrical energy, limited internet and computer resources, insufficient water supply, lack of sanitation facilities, and poor hygiene practices contribute to the non-compliance of schools with SDG 4.A.1.

Furthermore, the situation is exacerbated by a lack of funding for essential initiatives such as the installation of toilets and handwashing stations, provision of adequate water supply systems, and provision of sanitary products for schools. Additionally, the absence of operational and maintenance measures to ensure the cleanliness and functionality of facilities further compounds the challenges faced by schools in meeting SDG 4.a.1 standards.

To address these pressing issues, the prioritization of educational facilities development is highly recommended. Such an action would provide a detailed roadmap for achieving specific targets within a defined timeframe, ensuring that schools can effectively improve their facilities to meet SDG standards. Moreover, integrating the development plan into the school's curriculum can help prioritize and institutionalize efforts to enhance educational facilities, ultimately contributing to a safer and more conducive learning environment for students.

CONCLUSIONS AND RECOMMENDATION

Conclusions

Based on the findings of the study, the following conclusions were made:

The school administrators and teachers indicated limited access of electricity, computer, and basic hand washing. Both the school administrators and teachers agreed on the poor internet access and number of classrooms; however, the school administrators indicated limited or average level while the teachers indicated poor level on the service of basic drinking water, and school safe learning facilities.

Insufficient access to electricity, reliable internet, and essential technology, combined with inadequate water supply, inadequate bathroom facilities, and a lack of emphasis on hygiene practices, were all significant factors that hinder compliance of schools with the Sustainability Development Goals (SDG4a.1).

The common challenges raised by the school administrators on school plant and facilities were the following: Electricity (Old electric wiring, Increasing monthly bill, Electricity not sufficient, and Over consumption); Internet for pedagogical purposes (Restricted wifi connectivity, Internet are for office use only, and Bandwidth limitation); Computer for pedagogical purposes (Insufficient number of computers for the learner and No available technician around); Adapted infrastructure and materials for students with disabilities (Overcrowding resulted in insufficient classroom space, No budget for additional room, and Lacks budget for infrastructure and learning materials for students with disabilities); Basic drinking water (No regular supply of water, No water quality maintenance, No budget for filter, and Water pump is for cleaning not for drinking); Single-sex sanitation facilities (Lacks water supply for cleaning the restroom, No budget for additional restroom, Plumbing issues, and No regular maintenance for restroom); Basic hand washing facilities (Water supply not available, Lacks budget for supplies, Overcrowded, and Power shortage stops the water supply or the pump). Based from the enumerated issues and challenges, the school administrators faced difficulty in managing educational facilities mainly because of lack of budget and assistance from the DepEd and other local and national agencies.

Recommendations

Based on conclusions of the study, the following were hereby recommended:

School Administrators can submit data on educational facilities requiring significant repairs as indicated by EBEIS, NSBI, and/or OUA/EFD surveys. to concerned agencies for assistance. The Department of Education (DepEd) should also acknowledge the vital importance of understanding the interconnectedness of the issues and challenges, as well as the necessity for comprehensive and practical solutions.

Collaborative endeavors by government, teachers, societies, and corporate sectors have the potential to drive projects focused on overhauling the system of education, particularly in remote regions. Parent-teacher associations, which were driven by the community, have the potential to be highly effective in campaigning for additional funding and fostering a collective sense of responsibility for children's education. furthermore, the the design and implementation of an educational facilities development plan is highly recommended.

REFERENCES

Ahmad, T. (2019). Scenario-based approach to re-imagining future of higher education which prepares students for the future of work. Higher Education, Skills and Work-Based Learning.

Ahmed, J. & Wong, L.P. et al. (2022). Drinking water, sanitation, and hygiene (WASH) situation in primary schools of Pakistan: the impact of WASH-related interventions and policy on children school performance. Retrieved May 13, 2023, from https://link.springer.com/article/ 10.1007/s11356-021-15681-wciteas

Alam, M. J., & Kaneko, S. (2019). The Effects of Electrification on School Enrollment in Bangladesh: Short- and Long-Run Perspectives. Retrieved December 24, 2022, from. https://doi.org/10.339 0/en12040626

Alhabeeb, A. (2018). E-learning critical success factors: Comparing perspectives from academic staff and students. Retrieved May 11, 2023 from https://www.sciencedirect.com/science/article/abs/pii/S036013151302112

Al-Kuwari, M.M., Du, X. & Koç, M. Performance assessment in education for sustainable development: A case study of the Qatar education system. Prospects 52, 513–527 (2022). https://doi.org/10.1007/s11125-021-09570-w

Anderson, & Raine. (2018). Improvements ahead: How humans and AI might evolve together in the next decade. Retrieved May 14, 2023, from https://www.pewresearch.org/internet/2018/12/10/improvements-ahead-how-humans-and-ai-might-evolve-together-in-the-next-decade/

Barrett, P., & Alberto, T. (2019). The Impact of School Infrastructure on Learning. International Development in Focus. Retrieved December 24, 2022, from https://files.eric.ed.gov/fulltext/ED604388.pdf

Basri. (2018). ICT Adoption Impact on Students' Academic Performance: Evidence from Saudi Universities. Retrieved May 14, 2023, from https://www.hindawi.com/journals/edri/2018/1240197/

Beehray. (2021). The pathway to progress on SDG 4 requires the global education architecture to focus on foundational learning and to hold ourselves accountable for achieving it. Retrieved May 13, 2023, from https://www.sciencedirect.com/science/article/pii/S0738059321000286

BioLoo, B. (2020). Effective Water, Sanitation and Hygiene (WaSH) in Schools Leads to Completion of Education and Decreases Girls Dropouts Indian SME and Large Corporation Partnering in Support of Goals 6 and 4 | Department of Economic and Social Affairs. Department of Economic and Social Affairs-Sustainable Development. Retrieved December 27, 2023, from https://rb.gy/9pk7y

Briones Alonso, E., Van Ongevalle, J., Molenaers, N., & Vandenbroucke, S. (2021). SDG Compass guide: Practical frameworks and tools to operationalise agenda 2030. HIVA-KU Leuven Working Paper.

Brago, L. (2022). Philippines sees progress in SDGs – Manalo. Retrieved May 14, 2023, from https://www.philstar.com/headlines/2022/07/20/219663 3/philippines-sees-progress-sdgs-manalo

Cavano . (2020). New Report says SDGs Won't Be Achieved Until 2092 - Now is the Time for Action. Retrieved May 14, 2023, from https:// thepalladiumgroup.com/news/New-Report-says-SDGs-Won't-Be Achieved-Until-2092-Now-is-the-Time-for-Action

CDC. (2020). Disease Threats and Global WASH Killers. Retrieved May 11, 2023 from https://www.cdc.gov/healthywater/global/WASH.html

Chirgwin, H. et al. (2021). Interventions promoting uptake of water, sanitation and hygiene (WASH) technologies in low- and middle-income countries: An evidence and gap map of effectiveness studies. Retrieved May 11, 2023, from https://onlinelibrary.wiley.com/doi/full/10.1002/cl2.1194

Creswell, J. (2013). Qualitative Inquiry & Research Design. Choosing Among Five Approaches. SAGE Publications, Inc. Retrieved December 27, 2023, from http://www.ceil-conicet.gov.ar/wp-content/uploads/2018/04/ CRESWELLQualitative-Inquary-and-Research-Design-Creswell.pdf

Dalglish, S. L. & McMahon, S. A. (2020). Document analysis in health policy research: the READ approach. https://doi.org/10.1093 /heapol/ czaa064

Demirbağ İ, Sezgin S. Book review: Guidelines on the development of open educational resources policies. The International Review of Research in Open and Distributed Learning. 2021;22(2):261–263. doi: 10.19173/irrodl.v22i2.5513. [CrossRef] [Google Scholar] [Ref list]

DepEd WinS Program (2016). DepED Order No. 10, "Policy and Guidelines on the Comprehensive Water, Sanitation, and Hygiene in Schools (WinS) Program.

Díaz, B. et al. (2019). Effects on academic performance in secondary students according to the use of ICT. IJERI: International Journal of Educational Research and Innovation, 12, 90–108. Retrieved December 27, 2023, from https://doi.org/10.46661/ijeri.40455

Duterte. (2023). Lack of school infra, resources most pressing issue in PH education. Inquirer,Net. Retrieved from https://newsinfo.inquirer.net

Educational Challenges in the Philippines (2023). Philippine Institute for Development Studies (PIDS).GOV.PH

Elfert, M. (2019). Lifelong learning in Sustainable Development Goal 4: What does it mean for UNESCO's rights-based approach to adult learning and education?. Int Rev Educ 65, 537–556 (2019). Retrieved May 13, 2023, from https://doi.org/10.1007/s11159-019-09788-z

Ferguson, T., Roofe, C., & Cook, L. D. (2021). Teachers' perspectives on sustainable development: the implications for education for sustainable development. Environmental Education Research, 1–17. [Ref list]

Ferraro. (2018). Is information and communication technology satisfying educational needs at school? Retrieved May 11, 2023, from https://www.sciencedirect.com/science/article/abs/pii/S0360131518300824

Fleming J. (2018). Methodologies, methods and ethical considerations for conducting research in work-integrated learning. Special Issue: Work-Integrated Learning. Retrieved October 5, 2023, from https://files.eric.ed.gov/fulltext/EJ1196755.pdf

Gutiérrez, F. (2020). Is the use of ICT in education leading to higher student outcomes? Analysis from the Spanish Autonomous Communities. Retrieved May 9, 2023, from https://www.sciencedirect.com/ science/article/abs/pii/S03601315203 01676?via%3Dihub

Han, H. (2019). Physical classroom environment affects students' satisfaction: Attitude and quality as mediators. Retrieved May 11, 2023 from https://www.ingentaconnect.com/content/sbp/sbp/2019/0000004700000005/art00009;jsessionid=2gou3k1w0eq5v.x-ic-live-02

Hayes. (2023). Descriptive Statistics: Definition, Overview, Types, Example. Retrieved May 14, 2023, from https://www.investopedia.com/terms/d /descriptive_statistics.asp

Henrietta. (2019). Education Must Be Seen as Public Good, Not Commodity: SDG 4 Review. Retrieved May 14, 2023, from https://rb.gy/2jw0l

Hernández, M. C.,et al. (2018). Multivariate characterization of university students using the ICT for learning. Retrieved May 11, 2023 from https://www.sciencedirect.com/science/article/abs/pii/S0360131518300575

High-Level Political Forum on Sustainable Development (2023). Review of SDG implementation and interrelations among goals. Discussion on SDG 4 – Quality education. Tuesday, 9 July 2019, 3:00 PM–6:00 PM, Conference Room 4

Ilomaki, &Lakkala. (2018). Digital technology and practices for school improvement: innovative digital school model. Retrieved May 13, 2023, from https://rb.gy/p2kbu

Julien, H. et al. (2018). Survey of Information Literacy Instructional Practices in U.S. Academic Libraries. Retrieved May 11, 2023 from https://crl.acrl.org/index.php/crl/article/view/16606

Kocak, E. &Oralhan, B. (2023). The impact of electricity from renewable and non-renewable sources on energy poverty and greenhouse gas emissions (GHGs): Empirical evidence and policy implications. Energy, 272, 127125. https://www.sciencedirect.com/science/article/abs/pii/S036 0544223005194?via%3Dihub

Marope, P. T. M. (2016). Quality and development-relevant education and learning: Setting the stage for the Education 2030 Agenda.

Matthew UO, Kazaure JS. Multimedia e-learning education in nigeria and developing countries of Africa for achieving SDG4. International Journal of Information Communication Technologies and Human Development (IJICTHD) 2020;12(1):40–62. doi: 10.4018/IJICTHD.2020010103.

Mejdalani, A. (2018). A Brighter Future: The Impact of Rural School Electrification Programs on the Dropout Rate in Primary Education in Brazil. Retrieved December 23, 2022 from https://publications.iadb.org/en/ brighter-future-impact-rural-school-electrification-programs-dropout-rate-primary-education-brazil

Michael, O. (2019). IMPACT OF SCHOOL FACILITIES ON THE ACADEMIC PERFORMANCE OF SECONDARY SCHOOL STUDENTS IN KADUNA STATE, NIGERIA (Publication No. ISSN 2348-3164) [Master's Thesis]. https://www.researchpublish.com/upload/book/IMPACT%20OF%2SCHOOL%20FACILITIES-7960.pdf

Morgan, H. (2022). Conducting a Qualitative Document Analysis. The Qualitative Report, 27(1), 64-77. Retrieved April 3, 2023 from https://doi.org/10.46743/2160-3715/2022.504

Navarro, A. M. (2022). School infrastructure in the Philippines: Where are we now and where should we be heading?. Retrieved December 23, 2022 from https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps2210.pdf

NEDA. (2022). Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for all. Retrieved May 14, 2023, from https://sdg.neda.gov.ph/goal-4/

Nitter, K. (2022). How does light impact our school pupils? Norwegian SciTech News. Retrieved December 23, 2022 from https://rb.gy/gf4ku

Olugbenga, M. (2019). Impact of School Facilities on the Academic Performance of Secondary School Students in Kaduna State, Nigeria (Publication No. ISSN 2348-3164) [Master's Thesis].

Pandey, B, (2018). Achieving SDG 4 in India: Moving from quantity to quality education for all. Retrieved December 15, 2022 from https://rb.gy/ywpimo

Patrilla., (2019). Phenomenology Of Bullying from The Perspective of The Bully: A School Intervention Program. Unpublished Master's Thesis. Universidad De Manila

Phiri,C. et al. (2021). An assessment of the impact of Electricity Power Outages on University Students' life, Lusaka, Zambia: A University perspective study. Retrieved May 13, 2023, from https://www.researchgate.net/publication/350524976_An_assessment_of_the_impact_of_Electricity_Power_Outages_on_University_Students'_life_Lusaka_ZambiaUniversity_perspective_study/citations

Power, E. et al. (2020) Integrated 'one-stop' support for student success: recommendations from a regional university case study, Higher Education Research & Development Retrieved May 11, 2023 from https://www.tandfonline.com/doi/abs/10.1080/07294360.2019.1676703?journalCode=cher20

PSA. (2023). SDG INDICATOR. Philippine Statistic Office. Retrieved June 7, 2023, from https://openstat.psa.gov.ph/Featured/National-Database-on-Child-Poverty/Sustainable-Development-Goals-Goal-4

Pulsiri, N. et al. (2019). Achieving Sustainable Development Goals for People with Disabilities through Digital Technologies. 2019 Portland International Conference on Management of Engineering and Technology (PICMET). https://doi.org/10.23919/picmet.2019.8893725

Remes, J. (2020). Poor Health Reduces Global GDP by 15% Each Year. Retrieved May 11, 2023, from https://hbr.org/2020/07/research-poor-health-reduces-global-gdp-by-15-each-year

Rice. (2019). Document Review. Retrieved April 3, 2023 from http://sites.gsu. edu/rrice7 /2019/04/11/document-review/

Rodriguez, C. (2022). Consolidation of sustainable and healthy entrepreneurship based on resonant leadership and labor performance. Retrieved April 3, 2023 from https://www.redalyc.org/journal/280/28073811034/html/

Saini M, Sengupta E, Singh M, Singh H, Singh J. Sustainable Development Goal for Quality Education (SDG 4): A study on SDG 4 to extract the pattern of association among the indicators of SDG 4 employing a genetic algorithm. Educ Inf Technol (Dordr). 2023;28(2):2031-2069. doi: 10.1007/s10639-022-11265-4. Epub 2022 Aug 11. PMID: 35975216; PMCID: PMC9371379.

SDGs - Philippines. (2022). Goal 4 – Quality Education - SDGs - Philippines. SDGs - Philippines -. Retrieved December 29, 2022, from https://sdg.neda. gov.ph/goal-4/

Seland. (2022). Conditions Contributing to Positive and Negative Outcomes of Children's ICT Use: Protocol for a Scoping Review. Retrieved May 14, 2023, from https://www.mdpi.com/2075-4698/12/5/125

Sensix. (2022). Effects of lack of energy on education. Retrieved May 13, 2023, from https://sensix.io/blog/effects-of-lack-of-energy-on-education

Shah, V. et al. (2022). Effects of Menstrual Health and Hygiene on School Absenteeism and Drop-Out among Adolescent Girls in Rural Gambia. Retrieved December 29, 2022, from https://www.mdpi.com/1660-4601/19/6/3337

Sharma, M. K., & Adhikari, R. (2022, May 31). Effects of Water, Sanitation, and Hygiene on the School Absenteeism of Basic Level Students in the Government School of Nepal. Retrieved May 13, 2023, from https://doi.org/10.3389/feduc.2022.869933

Shiohira, K. (2021). Understanding the impact of artificial intelligence on skills development. Education 2030. UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training. [Ref list]

Simeon, L. M. (2022, March 23). Philippines needs more investments in school infrastructure–PIDS. Philstar.com. Retrieved December 23, 2022 from

https://www.philstar.com/business/2022/03/24/2169396/philippines-needs-more-investments-school-infrastructure-pids

Villegas. (2022). Addressing the Philippine education crisis. Retrieved May 13, 2023, from https://www.bworldonline.com/opinion/2022/09/27/ 476965/addressing-the-philippine-education-crisis-5/

UNESCO. (2019). Discussion on SDG 4 – Quality education. High Level Political Forum. Retrieved May 13, 2023, from https://sustainabledevelopment .un.org/content/documents/23669BN_SDG4.pdf

UNICEF. (2022). Drinking-water. Retrieved from https://www.who.int/ news-room/fact-sheets/detail/drinking-water

World Bank. (2019). The Education Crisis: Being in School Is Not the Same as Learning. Retrieved May 13, 2023, from https://www.worldbank. org/en/news/immersive-story/2019/01/22/pass-or-fail-how-can-the-world-do-its-homework

Youssef, A. et al. (2022). ICT Use, Digital Skills and Students' Academic Performance: Exploring the Digital Divide. Information, 13(3), 129. MDPI AG. Retrieved May 11, 2023 from http://dx.doi.org/10.3390/ info13030129