



Sustainable Development Goals Program in Primary Schools in the ASEAN Region: A Bibliometric and Systematic Review 2014-2024

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ABSTRACT

Sustainable Development (SDGs) has become a popular topic in many studies which prove how important the movement is to the nation's growth. The aim of this research is to explore popular research trends, especially on SDGs programs related to ASEAN elementary schools from 2014-2024. This research design is a bibliometric research method. This method is used to study the most significant topics and determine the quantity of SDGs publication trends. The results of this research show that research that has increased significantly is regarding sustainable education which reflects that basic education does not only focus on literacy and numeracy but also achieves desires, social justice, and students resulting in the achievement of SDG 4. Analysis of the themes found that the majority of research focus on inclusive education, social welfare, and economic outlook among ASEAN countries. The conclusion of this research is that the increase in research regarding SDGs in elementary schools has increased, there is a need for regional cooperation to distribute best practices to instill SDGs values into the basic education curriculum so that fair, inclusive and sustainable education can be achieved.



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INTRODUCTION

The Sustainable Development Goals (SDGs) program, launched by the United Nations in 2015, aims to promote solutions to the important challenges that most nations face (Dugarova & Gülasan, 2017; Saxena et al., 2021). The program has 17 goals that cover many aspects such as decreasing poverty, increasing good health, and giving solutions to climate change. every goal has played a significant role in improving the quality of our planet and maintaining sustainable things within (Fonseca et al., 2020; Leal Filho et al., 2019). Educational Goal 4 encourages a fair and

high-quality education that is accessible to everyone (Rad et al., 2022). Education can't be split from the problems that nations face nowadays. since Sustainable Development Goals (SDGs) have a role in maintaining education to equipt young people with the values, knowledge, and skills they need to contribute to economic, social, and environmental development (Cottafava et al., 2019).

The skills needed by students of high school is quite different from elementary one since elementary school needs to equip students basic knowledge and skills they need for secondary and higher education (Beighle & Pangrazi, 2019; Sumardi et al., 2020). Basic education within the SDGs goes beyond just literacy and numeracy; it also encompasses sustainability, gender equality, social inclusion, and health and well-being (Hanemann & Robinson, 2022; Reimers, 2024). This aligns with worldwide efforts to build a fair, peaceful, and sustainable society. The same access to education for all children of different genders, economic classes, and backgrounds is not enough to improve their quality of education as well. This can be relevant to the condition of the world to improve their critical thinking and support them to socialize with their communities. SDGs must be implemented in ASEAN primary school education to solve the issues (Glavič, 2020).

ASEAN countries exhibit a wide range of economic, cultural, and social development levels, leading to varied strategies for implementing the SDGs. ASEAN countries recognize how crucial basic education is for reaching sustainable development goals. Sharing knowledge, sources and resources as well as best practices is hot issues (Lepore et al., 2021; Stoddart et al., 2020). By incorporating SDGs into the primary school curriculum, we aim to equip the younger generation in the region to tackle future challenges and help create a more sustainable world. In Elementary school education, students are taught not only literacy and numeracy but also such values as equity, sustainability, and inclusion so that they can learn how to take responsibility, aware of the situation at the environment, and keep the peace among others (Muafiah et al., 2021).

The purpose of SDGs implemented in elementary school education curriculum was to help students understand balances in social and the environment so that they effect the sustainable development of the nation in the future. This study aims to examine the research trend in Asean elementary schools from 2014 to 2024 Referring to the importance of integrating SDGs in Elementary school education. this study was conducted by reviewing current literature and research data to get the insight into SDGs policies, programs, and strategies in elementary school education. This trend is such an important things to explore more as SDGs including gender equity, health, and poverty eradication. Thus, this article aims to examine the research trends to provide steps for achieving SDGs in ASEAN region.

METHODS

Research Design

This study employs bibliometric analysis. Bibliometric analysis serves as a quantitative method to evaluate and describe research trends and the characteristics of published works. To provide an overview of the structure of a particular study, bibliometric visualization is used (Sajovic & Boh, 2022).

Research Subject

This research involves 270 articles found using the keyword "sustainable AND development AND goals AND program AND in AND primary AND schools" from the Scopus database. Most of the publications analyzed come from journal articles and conference proceedings. The data collected focuses specifically on open-access articles.

Indicator

This study uses indicators that represent articles published over the last 10 years (2014-2024) and indexed in VOSViewer. The analysis focuses on the total link strength between visualized items, the number of publications, and the number of citations.

Procedure

Metadata from the Scopus database was analyzed for the last 10 years (2002-2023), focusing on augmented reality studies in the context of primary education. VOSViewer, a tool used to analyze, visualize, and evaluate publication data, helps identify citation counts, publication volumes, sources used, institutional distribution, article languages, and sources for studying biology. VOSViewer is highly useful for creating network visualizations based on the most frequently used terms in a research domain (Huang et al., 2022).

RESULTS

a. Research document Sustainable Development Goals (SDGs) in primary schools in the decade (2014-2024)

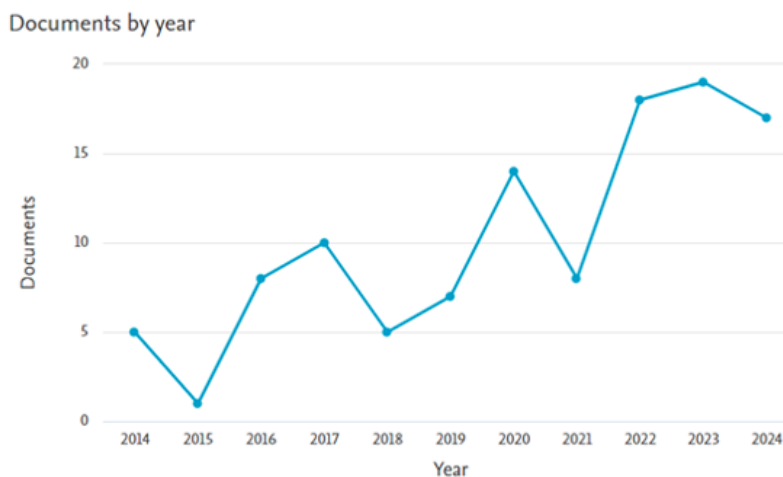


Figure 1. Document of Sustainable Development Goals (SDGs) Research in Primary Schools

The figure shows the documents produced year by year on Sustainable Development Goals and research trends in elementary schools from 2014 to 2024. The publications was relatively low, with 5 documents in 2014, and a decrease 4 documents in 2015. However, this trend started to show a significant increase of 10 documents in 2017. After the decrease to 5 documents in 2018, SDGs-related research increased consistently again. In 2020, the number of publications jumped to 14 documents, indicating an increased interest in this topic. This

trend continued, with the number of publications reaching 19 documents in 2023. Although in 2024 the number of documents decreased slightly to 17. This figure shows the increasing interest and attention to SDGs research in elementary schools over the past decade.

b. Distribution of research documents related to Sustainable Development Goals (SDGs) in Primary Schools

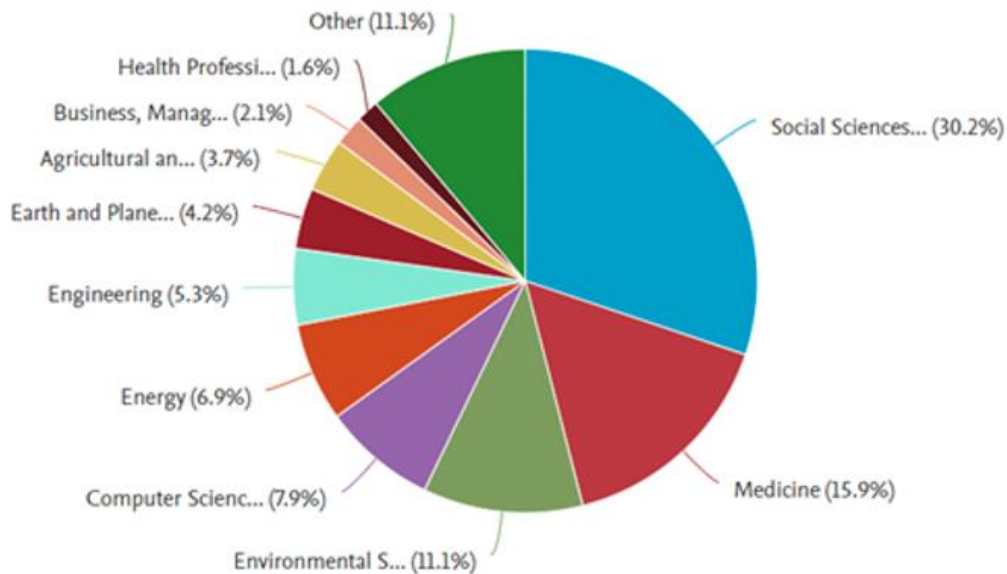


Figure 1. Subject Area of Sustainable Development Goals (SDGs) Research in Primary Schools

The figure shows documents based on the subject area related to Sustainable Development Goals (SDGs) based on the subject area in Scopus. Research on SDGs is dominated by Social Sciences with 30.2%, covering aspects of education, social welfare and equality, and relevant to educational development in primary schools. Medicine was the second with 15.9%, showing the focus on health and well-being, including child health relating to policy in primary schools. Environmental Science has a share of 11.1%, indicating the importance of environmental issues in the context of sustainability, such as environmental education programs in primary schools. Computer Science with 7.9% indicates the role of technology in supporting SDGs-based learning in primary schools, especially in the development of digital learning tools. Other fields such as Energy and Engineering also contribute, but in smaller proportions.

c. Trends in Sustainable Development Goals (SDGs) Research in primary schools (2014-2024)

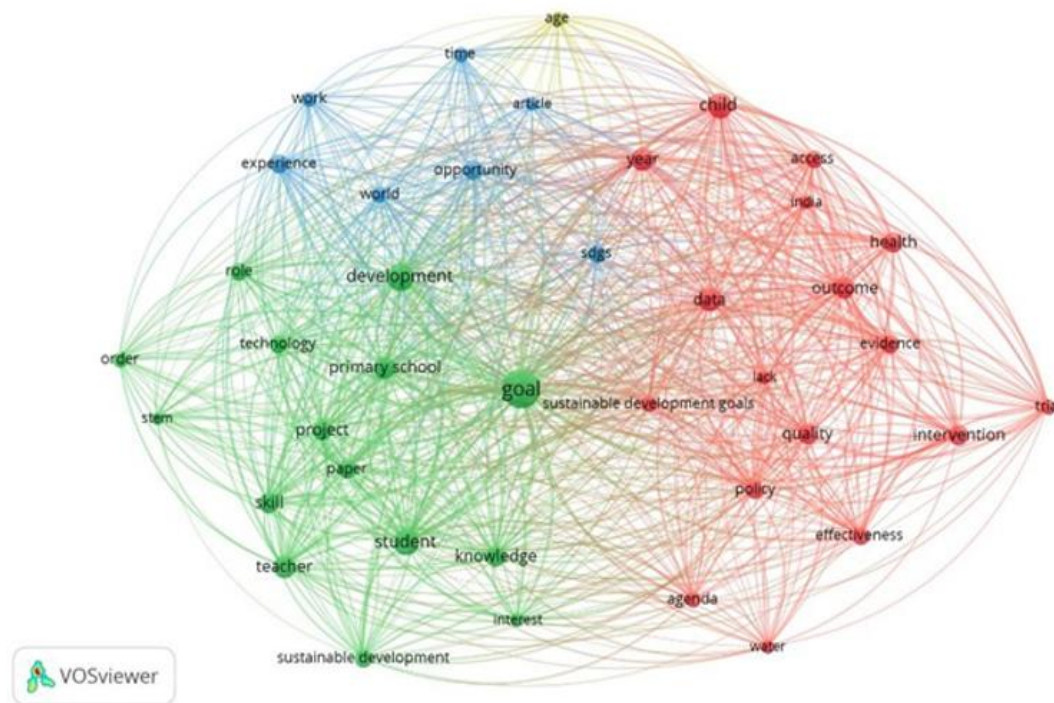


Figure 3. Trends in Sustainable Development Goals (SDGs) Research in Primary Schools

This figure shows a visualization of the keyword linkage map in research on the Sustainable Development Goals (SDGs), specifically related to primary schools. The keywords are grouped in different colors that indicate clusters based on the relationship between topics.

- 1) **Green Cluster:** The focus of this cluster is education, especially at the primary school level. Words such as goal, primary school, student, teacher, project, and technology indicate research related to the role of teachers, students, and the integration of technology in elementary school education to achieve the SDGs. This cluster reflects how primary schools, through various projects and skills developed, play an important role in supporting sustainability goals, especially those related to inclusive and quality education.
- 2) **Red Cluster:** Focuses on aspects of health and data, with words such as child, health, data, outcome, and policy. Research in this cluster is related to child health, health policy, and data-driven interventions that support SDGs goals in health, including in primary schools.
- 3) **Blue Cluster:** Focuses on more general opportunities and experiences, with words like time, experience, world, and opportunity. This could relate to research on global experiences and time spent on achieving the SDGs, including educational opportunities in primary school.

The visualization shows that SDGs-related research in primary schools covers a wide range of important themes, from education, health, and technology to evidence-based policies and interventions.

d. Sustainable Development Goals (SDGs) document in primary schools in the ASEAN region.

Table 1. Document in primary schools in the ASEAN region

No Paper	Article Title	Author Name	Results
P1	Vocabulary Acquisition Perceptions Using Kagan's Fan-N-Pick Among Papua and Non-Papua Students for SDGs in Indonesia	(Saputro et al., 2024)	This research looked at the <i>Fan-N-Pick</i> method developed by Kagan to improve the vocabulary acquisition skills of Papuan and non-Papuan students in Indonesia. It shows that collaborative learning methods can improve language learning outcomes, which is an important aspect of SDG 4 (quality education) to create inclusive and equal education.
P2	A Hybrid Digital Parenting Program Delivered Within the Malaysian Preschool System: Protocol for a Feasibility Study of a Small-Scale Factorial Cluster Randomized Trial	(Cooper et al., 2024)	This digital parenting program implemented in the Malaysian preschool system is designed to support children's early education relevant to SDG 4. This research examines the feasibility of implementing this program on a small scale and leads to the development of more modern educational methods that can aid early quality education.
P3	The Circular Economy Concept of Mahidol University, Salaya Campus, Thailand	(Charmondusi t & Mahisavariya, 2023)	While the main focus of this research is at the university level, the circular economy concepts taught include sustainability values in line with SDG 12 (responsible consumption and production) and could potentially be part of the primary curriculum, providing students with an understanding of the principles of the circular economy.
P4	Implementation of Adiwiyata program on environmental sustainability in public vocational high schools of Malang: Student participation perspective	(Nurrochmat et al., 2022)	The Adiwiyata program focuses on student participation in sustainable activities at school, which is relevant to SDG 13 (climate action). This implementation highlights the importance of student engagement in environmental activities and demonstrates how educational programs can effectively integrate environmentally friendly practices into daily life.
P5	Introducing a tool to gauge curriculum quality under Sustainable Development Goal 4: The case of primary schools in Vietnam	(Hoang et al., 2020)	This research introduces a tool to assess curriculum quality in primary schools in Vietnam in the context of SDG 4. The tool helps evaluate the extent to which the curriculum meets international standards in providing quality, equitable and inclusive education, in line with SDG 4 targets.
P6	Headteacher Change Leadership Competency in Malaysian Primary Schools	(Tai & Abdull Kareem, 2020)	This study highlights the leadership competencies of principals in primary schools in Malaysia. Strong and innovation-focused leadership is needed to ensure that

No Paper	Article Title	Author Name	Results
			the goals of the SDGs, particularly SDG 4, can be effectively implemented in primary schools.
P7	The impact of an operation and management intervention on toilet usability in schools in the Philippines: A cluster randomized controlled trial	(Buxton et al., 2019)	This study evaluated the impact of management and operations interventions on toilet use in elementary schools in the Philippines. The findings are relevant to SDG 6 (access to safe water and sanitation), as a healthy and clean school environment contributes to students' health and well-being, which is part of the broader education goal.
P8	Inclusive Education Program Evaluation in Elementary School Education in West Java Province Indonesia	(Wijaya et al., 2021)	This evaluation highlights the importance of inclusive education programs in primary schools in West Java, Indonesia. The findings support SDG 4 which focuses on inclusive and equitable education for all children, including those with special needs.

Data presented in Table 1, there are three findings that can be interpreted. The findings in this research relate to the role of Sustainable Development Goals, Sustainable Development Goals policies and Sustainable Development Goals (SDGs) programs.

a. The role of Sustainable Development Goals

Sustainable Development Goals (SDGs) have an essential role in promoting quality and inclusive education in certain publications evaluated. A Hybrid Digital Parenting Program in the Malaysian Preschool System supports SDG 4's inclusive and equitable early education, as shown in article P2. Article P3, on The Circular Economy Concept at Mahidol University, Thailand, underlines the significance of integrating sustainability concepts into the curriculum to meet SDG 12 on responsible consumption and production. Article P4 on the Implementation of the Adiwiyata Program on Environmental Sustainability in Public Vocational High Schools of Malang stresses student participation in sustainability initiatives, which links to SDG 13 on climate action. These articles show how ASEAN education efforts promote excellent education, environmental sustainability, and social inclusion to accomplish the SDGs.

b. Sustainable Development Goals Policy

ASEAN primary schools prioritize integrating sustainable principles and inclusive education in its curriculum to align with Sustainable Development Goals (SDGs). Article P8 on Inclusive Education Program in West Java, Indonesia indicates that inclusive education programs are essential to SDG 4, which promotes equitable and quality education for all children, including those with special needs. Additionally, research P5 on Curriculum Quality Assessment for SDG 4 in Vietnam shows how assessment techniques can be utilized to guarantee primary school curricula fulfill international criteria for quality education. However, article P4 on Implementation of Adiwiyata Program on Environmental Sustainability in Public Vocational High Schools of Malang

shows how students' daily learning experiences can incorporate environmental activities to support SDG 13 on climate action.

c. Sustainable Development Goals Program

Sustainable Development Goals (SDGs) programs in primary schools in the ASEAN region are structured to facilitate the attainment of sustainable development objectives through diverse initiatives. Article P8 on the Inclusive Education Program in West Java, Indonesia emphasizes the significance of inclusive education initiatives in providing equitable access to education for all children, particularly those with special needs, thereby supporting Sustainable Development Goal 4. Furthermore, article P4 discusses the implementation of the Adiwiyata Program on environmental sustainability within public vocational high schools in Malang, illustrating how the integration of environmentally friendly activities into the curriculum facilitates student engagement in climate action, thereby supporting SDG 13. The programs, in conjunction with the teacher training outlined in article P6 regarding Headteacher Change Leadership Competency in Malaysian Primary Schools, illustrate initiatives aimed at fostering innovative and inclusive teaching methodologies in primary education. These initiatives facilitate the attainment of the Sustainable Development Goals in elementary school education in the ASEAN region.

DISCUSSION

Elementary school education is essential for achieving SDG 4, which aims to provide inclusive and quality education for all children. The UNESCO Global Education Monitoring (GEM) Report shows that elementary school education is designed to impart fundamental skills, including reading, writing, and arithmetic, while also fostering a comprehensive awareness of the social and environmental challenges that future generations will encounter (UNESCO, 2022). Education in SDG 4 must adhere to the principles of social welfare, gender equality, and environmental sustainability (Chankseliani & McCowan, 2021; Pathania, 2017). The UNESCO report emphasizes the necessity of a curriculum that integrates sustainability values. Elementary school education plays a crucial role in fostering awareness of climate change, promoting environmental conservation, and advancing equality. In certain ASEAN nations, including Indonesia, environment-based education initiatives like Adiwiyata have been introduced to foster early awareness among students regarding the significance of nature conservation.

SDG 4 aims to promote inclusive and quality education for all students from elementary school onward. The Global Education Monitoring (GEM) study by UNESCO indicated that primary school education imparts essential skills such as reading, writing, and arithmetic, while also enhancing awareness for social and environmental conduct (UNESCO, 2022). Education under SDG 4 must conform to the objectives of social welfare, gender equality, and environmental sustainability (Chankseliani & McCowan, 2021; Istiqfaroh et al., 2020; Pathania, 2017). The UNESCO study underscores the imperative of a curriculum that incorporates ecological principles. Elementary education is essential for cultivating knowledge of climate change, encouraging environmental conservation, and promoting equality. In certain ASEAN countries, such as Indonesia, environment-focused educational programs like Adiwiyata have been implemented to cultivate early awareness among students about the need of environmental protection.

UNICEF shows that inclusive basic education is crucial for tackling social and gender inequalities (Shaeffer, 2019). This remains a major challenge in many ASEAN countries, especially in rural and remote areas. Expanding access to quality basic education for everyone is essential to ensure that every child has a chance to succeed, in line with SDG target 4.5, which aims to eliminate discrimination in education. A holistic and value-driven approach to sustainability in basic education boosts students' academic skills and helps them grow into empathetic individuals who are more aware of global issues like climate change and social inequality (Rieckmann, 2018; Spychalski, 2023). The Asian Development Bank (ADB) research shows that educational inclusiveness is essential for achieving the Sustainable Development Goals (SDGs) in the ASEAN region (Hasibuan & Widiyanti, 2024). ASEAN shows significant differences in access to and quality of basic education, influenced by various socio-economic, geographical, and political factors. Children in rural and remote areas often have limited access to quality education compared to those in urban areas. This worsens existing educational gaps in many ASEAN countries.

ADB emphasizes the need for a more inclusive approach to education to close this gap. Inclusive education means ensuring that all children have not just physical access to schools, but also a nurturing and supportive learning environment. This encompasses children from minority groups, those with disabilities, and individuals living in poverty (Ackah-Jnr & Danso, 2019; Mitchell & Sutherland, 2020). SDGs 4.5 highlights the importance of eliminating inequity and discrimination in education, which is a key focus for educational policies in many ASEAN countries. To address this challenge, ADB encourages ASEAN countries to improve regional cooperation in sharing best practices for inclusive education (Khalid et al., 2019; Nakao, 2020). Countries can learn from successful programs such as Indonesia's Inclusive Education Program and the Philippines' Special Education Initiative. These programs focus on ensuring all children have access to education while incorporating sustainability principles into the basic education curriculum, directly supporting the goal. This partnership is crucial because each ASEAN country faces unique challenges. As a result, successful nations' effective strategies can be adapted to fit the unique needs of various countries. As a result, education systems in ASEAN can gradually become more inclusive, equitable, and sustainable, in line with the goal of SDG 4, which promotes quality education for everyone.

CONCLUSION

This study shows a significant increase in research trends related to the implementation of Sustainable Development Goals (SDGs) in primary schools across ASEAN from 2014 to 2024. This increase reflects a growing awareness of the importance of elementary school education in achieving SDG 4, highlighting the need for inclusive and quality education for everyone. Elementary school education includes literacy and numeracy, as well as sustainability, social welfare, and equality. The thematic analysis reveals that studies on Sustainable Development Goals (SDGs) in elementary education mainly focus on social welfare, inclusive education, child health, and environmental concerns. Implementing the SDGs in ASEAN faces challenges mainly because of socio-economic differences and the varied cultural contexts of each member country.

Collaboration among ASEAN countries is crucial for exchanging best practices and effective strategies to integrate SDG principles into basic education. This study shows that successfully implementing the SDGs in primary schools requires a thorough and inclusive approach, along with strong policy support in each country. The impact of this research is that the education system in ASEAN can better prepare future generations to face global challenges.

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