

MAPPING OF SUSTAINABLE DEVELOPMENT IN INDONESIA THROUGH EDUCATION FOR SUSTAINABLE DEVELOPMENT

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Abstrak: Universitas perlu mengupayakan pendidikan interdisipliner untuk pembangunan berkelanjutan. SDG 4.7 mempromosikan pendidikan pembangunan berkelanjutan untuk mengembangkan pemimpin. Pembangunan berkelanjutan mencakup kemakmuran ekonomi, distribusi sumber daya yang adil, penggunaan energi, kesehatan dan kesadaran lingkungan, serta isu-isu lingkungan global seperti perubahan iklim, hilangnya keanekaragaman hayati, dan kemiskinan. Penelitian ini menggunakan pendekatan kualitatif dengan metode analisis isi. Data penelitian ini adalah hasil akhir mahasiswa dalam menyusun pemetaan sosial terkait isu SDGs di wilayahnya. Implementasi SDG 2030 di daerah memetakan beragam permasalahan pembangunan. 33 mahasiswa Indonesia berpartisipasi dalam pertukaran pelajar online Permata Sari. Pemetaan konsep meningkatkan pembelajaran, pemikiran, dan tindakan. Kerja lapangan memerlukan observasi dan pengumpulan data. Pembelajaran berdasarkan pengalaman adalah wajib bagi siswa. Mahasiswa mengamati isu-isu pembangunan lokal dan menggunakan teori pemecahan masalah untuk menyelesaikan interaksi lingkungan mahasiswa. Observasi mahasiswa, wawancara, dan data lainnya mendorong keberlanjutan kampus. Peta konsep provinsi di Indonesia merangkum temuan-temuan tersebut. Kursus ini mendorong keberlanjutan. Hasil penelitian ini mengungkap pengetahuan dan pengalaman mahasiswa mengenai konsep-konsep seperti kesejahteraan ekonomi, pemerataan sumber daya, penggunaan energi, serta kepedulian terhadap kesehatan dan lingkungan. Diharapkan dapat dikembangkan menjadi sistem pendidikan masa depan yang berkelanjutan. Kesimpulan penelitian ini menggaris bawahi kebijakan negara tentang perlunya sistem pembelajaran yang berorientasi pada Pembangunan Berkelanjutan.

Kata kunci: mapping; sdgs; pendidikan untuk pembangunan berkelanjutan

Abstract: Universities need to work on interdisciplinary education for sustainable development. SDG 4.7 promotes sustainable development education to develop leaders. Sustainable development includes economic prosperity, equitable resource distribution, energy use, health and environmental awareness, and global environmental issues like climate change, biodiversity loss, and poverty. This research uses a qualitative approach with content analysis method. The data for this research is the students' final results in compiling social mapping related to SDGs issues in their region. Local SDG 2030 implementation maps diverse development issues. 33 Indonesian university students participated in the Permata Sari online student exchange. Concept mapping enhances learning, thinking, and action. Fieldwork requires observation and data collection. Adult learning theory and content/situation analysis are used. Experiential learning is mandatory for students. Students observe local development issues and use problem-solving theory to solve student environment interaction. Students' observations, interviews, and other data promote campus sustainability. Indonesian province concept maps summarize the findings. This course encourages sustainability. The results of this research are revealing students' knowledge and experience regarding concepts such as economic prosperity, equal distribution of resources, energy use, as well as health and environmental concerns. It is hoped that it can be developed into a sustainable future education system. The conclusion of this research underline the state policy on the need for a learning system oriented towards Sustainable Development

Keywords: mapping; sdgs; education for sustainable development

INTRODUCTION

The world's change in realizing a sustainable future is one of the biggest challenges every country, including Indonesia, faces. As an archipelagic country rich in natural resources, Indonesia is experiencing a concerning ecological disaster. Various facts prove the damage caused to humans and the natural environment. The blurry picture of Indonesia's face from the results of research by (Avonanova, 2012) shows that the situation of forest degradation has been getting worse, namely since 1982-1990, it has reached 0.9 million hectares per year, in the period 1990-1997 degradation has reached 1.8 million hectares per year. Furthermore, in 1997-2000, forest damage reached 2.83 million hectares per year. From 2000-2006, forest damage reached 1.08 million hectares per year. In 2007, the degraded forest area in Indonesia reached 59.62 million hectares caused by illegal logging activities, conversion of forest areas into oil palm and rubber plantations, and forest fires. The decreasing area of Indonesia's forests has made most parts of Indonesia vulnerable to ecological disasters, such as droughts, floods, and landslides.

Indonesia has made various efforts to guide human activities towards sustainable development. However, in realizing it, obstacles must be faced. One of them is the ignorance or apathy of the community towards the concept of sustainability. The idea of sustainable development is complex and influenced by different pressures, experiences, and cultures (Bass et al., 1995). Although the concept of sustainable development has always been stated as a fundamental goal by governments, companies, non-governmental organizations, and national and international conference participants, this concept is still too general (Albareda et al., 2008; Bossel, 1999; Godemann & Michelsen, 2011; Husser et al., 2012). According to (Godemann & Michelsen, 2011), The idea of sustainable development necessitates a social understanding process that reaches the causes of problems and their solutions.

Education is critical to promote sustainable development and increase community capacity, especially for the younger", the United Nations stated in 2002 in Chapter 36 of Agenda 21. Therefore, they know about economic growth, resource allocation, energy use, and environmental and health concerns (UN, 1992). In many cases, our future generation needs insight, commitment, and understanding of their roles and responsibilities to create meaningful beliefs and actions related to sustainability. However, the problem is whether the awareness of schools and campuses as educational institutions has promoted sustainable development to become an important issue in developing the learning system. The next question is how should promoting sustainable development be fostered in appropriate learning methods. Learning methods are taken to find a formula for promoting sustainable development introduced to students.

Theory of Education for Sustainable Development, ESD (Åhlberg et al., 2005) highlights the growing significance of development that is culturally sustainable. It underlines the key components of sustainable development education—abilities, skills, expertise, knowledge, intelligence, creativity, and wisdom—for all facets of sustainable development. In order to make informed decisions that will benefit both the present and the future, people must develop the attitudes, skills, and knowledge that ESD promotes. Through interdisciplinarity and shared knowledge, it seeks to provide a high-quality education that addresses developmental and environmental challenges for a sustainable future. (Anyolo et al., 2018; Iliško & Badyanova, 2014). It has been recognized in several critical international documents (UNESCO, 2005, 2006, 2010) that By fostering the values and attitudes required for constructive social transformation, education plays a significant role in attaining sustainable development. According to (Ssossé et al., 2021), Although

there are many examples of ESD around the world, It has a minimal effect on accomplishing sustainable development objectives and is ineffective at scaling up. The foundational pillar of ESD underlines the significance of possessing the knowledge and abilities necessary to tackle the difficulties of establishing a more sustainable world.

Several countries have made sustainable development an essential issue in their learning systems. In Finland, concept mapping and heuristics Vee used to educate teachers about sustainable development were developed in the 1980s as a powerful form of self-analysis (Novak, 2010; Novak et al., 1984). GHK consultant in collaboration with Danish Technology Institute and Technopolis (2008) has implemented ESD in 33 European countries through various activities based on the three pillars of sustainable development (environmental, economic, and social).

A study by (Manolas & Littledyke, 2010), focusing on sustainable development education such as CO2 campaigns for students in partnership with researchers and policymakers in Denmark, helps the students feel 'capable' of doing something for sustainable development as citizens and small researchers. This activity teaches students to analyze CO2 emissions and compare and discuss the results, then find solutions that can reduce CO2 emissions. In addition, the most important thing is that these activities foster understanding and increase students' awareness of the importance of sustainable development.

ESD in Indonesia through *the Permata Sari Program*

Through the Directorate General of Basic Education, the Government of Indonesia succeeded in compiling Education Guidelines for Development and Sustainable Development in 2011. The objectives of preparing these Guidelines are 1) To provide stakeholders with an understanding of ESD; 2) to provide information on the direction of implementation and integration of ESD materials in the curriculum supported by curricular, extracurricular, local content, and cultural development programs in the education unit for participants; 3) provide an affirmation of the orientation of Education that is more in line with and more towards sustainable development; 4) develop public understanding and concern for sustainable development; and 5) provide knowledge and skills for teachers in making ESD models that include knowledge, values and abilities/generic life skills for students (Kemendikbudristek, 2011).

Now the Indonesian Ministry of Education and Culture has the Permata Sari education program. Permata Sari is an Online Student Exchange Program (on the network), attended by 33 State Universities from all regions in Indonesia. Sustainable development education has been studied through CSR and Community Development courses at the Veterans National Development University, Jakarta, as the organizing institution. Participants consisted of 33 students from various regions in the Indonesian archipelago with learning outcomes seeking the formation of student attitudes as future leaders to face the challenges of sustainable development. The method used is the application of the experiential learning model. This model is based on Experiential Learning Theory (ELT), which Kolb developed in the 1980s.

Rapid socio-cultural changes and improving education require new pedagogical approaches in the educational process. A learner-centered active/participative learning experience has replaced traditional teaching's teacher-centered assimilative learning. Experiential learning, based on (Rogers, 1969) The idea of "learning to do" refers to how

students learn and experience things during their time in school, where they gain practical knowledge and a healthy outlook on life. Experiential learning is a kind of active learning that enables students to use and analyze their experiences as they learn. In experiential learning, the focus is on the students themselves, and the efficiency of learning depends on "how to learn" and "how to think" (Baker & Robinson, 2016; Boggu & Sundarsingh, 2016; Chan, 2012). The "learning cycle," often known as the theory of practical learning, was developed by David Kolb. According to Kolb, experience learning is a comprehensive strategy that integrates experiences, logic, emotions, and senses as well as active experimentation, critical reflection, connections, and intelligence, which results in metacognition. The student may start their education at any point in the circle (Voukelatou, 2019). The creation of graduate traits and educational goals, which are essential for society, is being led by experiential learning pedagogy. It helps to improve socio-cultural understanding (Tomaškinová & Tomaškin, 2018), linking to extra curriculum activity (Kemp, 2011), improve students' participatory and critical thinking (Quesada-Pineda & Haviarova, 2014) and improve team work and collaborative skills (Bozoglu et al., 2016).



Source Reprinted by : Kolb, D. A. (1984) *the source of learning and development*

Figure 1. Kolb's Learning Cycle

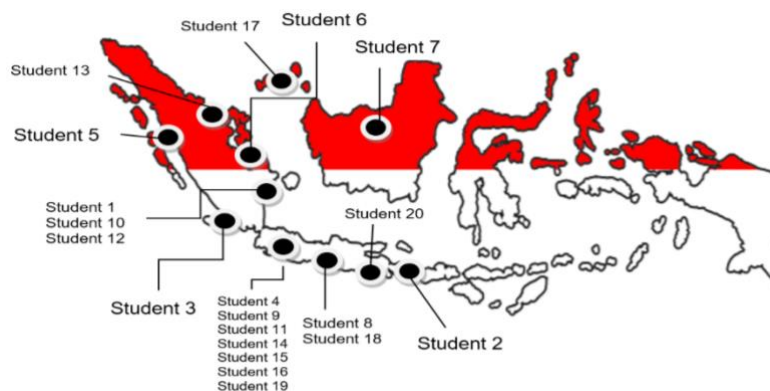
This methodology places a strong emphasis on a holistic approach to learning. Experience is key to learning in experiential learning, according to Kolb in (Baharudin & Wahyuni, 2017). By encouraging students to gain knowledge and skills through hands-on experience, the experiential learning model can therefore incorporate the idea of sustainable development at the same time. This model aims to influence students in three ways: a. Changing the cognitive structure of students, b. Changing student attitudes, and c. Extending students' existing skills. The three components interact and have an impact collectively rather than individually. Students' own involvement, initiative, self-evaluation, and the consequences that stick with them are all components of experiential learning's quality. Students practice in the field, record observations, and gather data during lectures. They conducted social mapping in their locality and research on the chosen field. We go into great detail on one part of the data in this study. Specifically, the way that students' fieldwork, which involves mapping out areas based on SDGs indicators using observations, interviews, and other data they gather, promotes sustainable development.

METHODE

With the use of the content analysis method, this study takes a qualitative approach. The data for this research is the final result of students compiling a social mapping related to SDGs in their area. Furthermore, how do they solve problems through CSR programs that are oriented to sustainable development promotions? Permata Sari Program students come from campuses in Indonesia. In this paper, temporary conclusions are drawn on how students understand their area during field practice related to sustainable development problems in Indonesia. This research aims to provide analysis, evaluation, and input on the importance of sustainable development-oriented Education as a form of debriefing for students as the younger generation.

Study Area

There are 20 students with the age range of the 20s in the third year of university. The program consists of 6 months which is in one semester. During the field trip, the students gather data about the local issues in their place related to specific goals of SDGs, their developed the CSR and community development as part of the solution from the SDGs issue. This research reveals the student knowledge and experience related to well-being and economic concept, pomeranian natural resources, energy consumption, and health and environmental concerns which it hopes will develop the Education system in sustainable development. Furthermore, the result of this study contributes to policy related to the educational system towards sustainable development. (Figure 2).



Source : Researcher Database (2023)

Figure. 2 Study Area

RESULT AND DISCUSSION

CSR-comdev course outcomes reflect esd values. It represents the three ESD perspectives—socio-cultural, environmental, and economic—and 15 components (UNESCO, 2005). Poverty, poor education, health, and environmental issues dominate. A sustainability-focused community empowerment program resulted. Environmental campaigns, community organization, community development, education and capacity building, resource mobilization, humanitarian aid management, and CSR research are taught in this course. Experiential learning lets students map the area, identify socio-cultural, environmental, and economic issues, and do project-based learning. Using

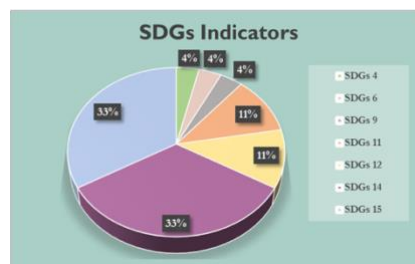
observations and interviews, the student discusses sustainable development. Students must think critically to solve these problems and design a local CSR program. This affects the project's student program reports' sustainable development values. Learning methods in CSR and community development courses to promote sustainable development. The online Permata Sari program sampled 20 Indonesian university students. They developed and applied ESD programs after analyzing their target area. (UNESCO, 2005)'s 15 ESD components and three perspectives (socio-cultural, environmental, and economic). Thus, 74% of students map SDGs issues in their study area from an environmental, 22% from an economic, and 4% from a 4% perspective. Students use more environmental ESD.

Table. 1 Mapping SDGs Issue in Indonesia

SDGs Indicator	Total Issue	Suppression (%)
SDGs 14	9	35
SDGs 15	9	35
SDGs 12	3	11
SDGs 11	3	11
SDGs 9	1	4
SDGs 6	1	4

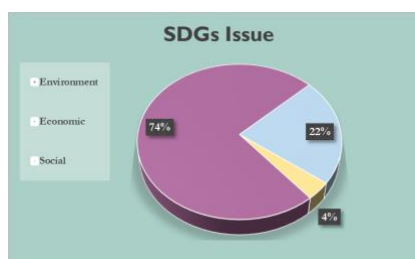
Source: Research database (2023)

This condition has implications for preparing the proposed program to find solutions for achieving SDGs indicators from the studied area. The program can be seen more clearly in the diagram:



Source: Researcher database (2023)

Figure. 3 SDGs Indicator Diagram






Source: Researcher database (2023)



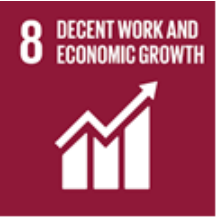

Figure. 4 SDGs Issue Diagram





By maintaining, restoring, and promoting sustainable use of terrestrial ecosystems, managing forests sustainably, battling desertification, preventing and reversing soil erosion, and halting biodiversity loss, students developed programmes to accomplish SDG 15 indicators by 33%. 33% of student program proposals addressed SDG 14's marine, ocean, and marine resource conservation and sustainable use for sustainable development. The program targets SDG 12. Consumption and production were sustainable. Students propose SDG 11-based urban and residential development programs. SDG 9 is 4% socially mapped. For these indicators, students propose resilient infrastructure, inclusive and sustainable industrialization, and innovation programs. Students map SDG 6 indicators to develop water and sanitation programs. Students highlight SDG 4's 4% problem, which supports lifelong learning.

Table. 2 Mapping SDGs Issue in Indonesia

1	<p>SDGs 15</p> 	South Sumatera
<p>Gelumbang District, Muara Enim Regency, South Sumatra Province's massive tourism development often outpaces its citizens' ability to manage it. Thus, Tourism Village Development is the best CSR program to address the above issues. Student 1</p>		
2	<p>SDGs 15</p> 	Sidoarjo, Central Java
<p>Lusi Island Development as a Sidoarjo Tourist Destination (Student 2)</p>		
3	<p>SDGs 14</p> 	Bengkulu, South Sumatera
<p>Analysis of the Development of Beach Tourism Objects in Bengkulu City (Student 3)</p>		

4	SDGs 6  Solid form of green shell in Domas village (Student 4)	Banten
5	SDGs 14  Infrastructure Gap That Affects Education in Sungai Patai is a village located in Sungayang sub-district, Tanah Datar Regency, West Sumatra (Student 5)	West Sumatera
6	SDGs 14  The Serving District of Jambi City experiences annual flooding. Waste also increases the risk of flooding because it is in a low area near the Batanghari River. (Student 6)	Kecamatan Pelayangan Kota Jambi.
7	SDGs 9  Education and community needs are limited by unpaved roads, affecting people's welfare. Potential analysis Agribusiness, Tourism, Natural Resources, and Culture can be developed in West Kalimantan, especially Ketapang Regency. (Student 7)	West Kalimantan

8	SDGs 15  Lake Tangerang Regency Wild Sand Excavation, Indonesia's problem is unequal education, especially in rural areas. Inadequate infrastructure and human resources cause inequality. (Student 8)	Sukabumi, West Java
9	SDGs 11  Excavation of Wild Sand at Lake Tangerang Regency, (Student 9)	Tangerang, Banten
10	SDGs 8  River estuary village Sungsang IV has many garbage piles because most of its garbage comes from the river. (Student 10)	Desa Sungsang IV, Provisinsi South Sumatera
11	SGDs 11  Tanjung Kait Beach in Tangerang Regency, Tanjung Anom Village, is a popular tourist destination for Greater Tangerang residents, but it has few facilities and a lot of sea garbage. (Student 11)	Tangerang, Banten

12	SDGs 11 	Baturaja, Kab. Ogan Komering Ulu, Prov. South Sumatera
	<p>Ogan Komering Ulu Regency's Residential Areas Housing and Settlement Service Office wants ugly public spaces. Poorly managed public spaces show it. Many Baturaja City public spaces are unused and damaged after a year. (Student 12)</p>	
13.	SDGs 11 	Medan, Sumatera Utara
	<p>Environmental issues in Medan City, North Sumatra, the 2019 Dirtiest Metropolitan City. The global governance system has begun to reorganize law and handling (PERGUB No. 3 of 2020, PERDA No. 6 of 2015, and PERWALI No. 26 of 2019), but it's still ineffective and needs other solutions to ease the government's burden.</p>	
14	SDGs 14 	Tangerang, Banten
	<p>Seawater pollution is caused by indiscriminate dumping of garbage that accumulates, causing seawater to change colour, where the beach is a tourism icon. (Student 14)</p>	
15	SDGs 14 	Banten
	<p>Shrimp pond waste pollutes rivers, seas, and marine ecosystems, making water dirty. Thus, proper handling prevents river and ocean pollution. Cleaning shrimp pond and community waste-contaminated rivers. (Student 15)</p>	

16 **SDGs 12** Batam



The plastic waste problem in Tanjung Piayu Old Village accumulates because there is no garbage disposal. (Student 16)

17 **SDGs 12** Bogor, West Java



The increase in organic waste at the household level during the COVID-19 pandemic caused various environmental problems due to the absence of final waste management facilities in Bogor City (Student 17).

18 **SDGs 15** Bogor, West Java



The increase in organic waste at the household level during the Covid-19 pandemic caused various environmental problems due to the absence of final waste management facilities in Bogor City (Student 18).

19 **SDGs 12** Banten



Tangerang residents suffer from many ex-sand excavations. If examined closely, this phenomenon could become a new tourist attraction. Telaga Biru, like Cisoka's ex-lake, is a tourist attraction. (Student 19)

20

SDGs 15

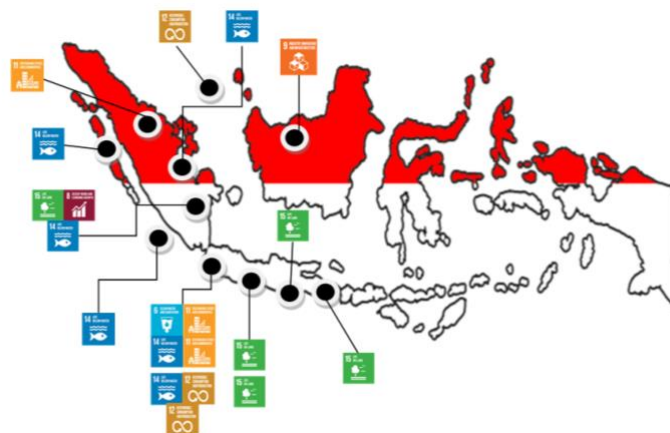


Daerah Istimewa
Yogyakarta, Central
Java

There is mountain garbage on the side of the road that has never been noticed, even though the pile of garbage is still in the area of buying and selling traditional villages (Student 20)

Source: Data analyzed by Researcher (2023)

Twenty Indonesian university Permata Sari online program participants were samples. ESD programs were implemented after target area analysis. Three ESD Perspectives (Socio-Cultural, Environmental, and Economic) and 15 components (UNESCO, 2005). Thus, 74% are environmental, 22% economic, and 4% political. Students use more environmental ESD. This impacts the area's proposed SDG indicator program. Plan 2. By maintaining, restoring, and sustaining sustainable terrestrial ecosystems, managing forests sustainably, battling desertification, preventing and reversing soil erosion, and halting biodiversity loss, students designed programs to accomplish SDG 15 indicators by 33%. This information matched 33% of the program ideas submitted by students for SDG 14, which calls for the conservation and sustainable use of marine, oceanic, and marine resources. Data shows the program targets SDG 12. Sustainable production and consumption. Students propose SDG 11-based inclusive, safe, resilient, and sustainable urban and residential development. SDG9 has 4% social mapping. Students recommend resilient infrastructure, inclusive and sustainable industrialization, and innovation programs. Students map SDG 6 indicators to create universal clean water and sanitation programs. The latest mapping shows students highlight SDG 4's 4% problem, hence the inclusive and equal quality education program supports lifelong learning for all.



Source: Data analyzed by Researcher (2023)

Figure. 5 Mapping of Sustainable Development Issue in Indonesia through Education for Sustainable Development

CONCLUSION

UPN Veterans Jakarta's Permata Sari has been adopting ESD through CSR and Community Relations courses. Experiential learning to promote sustainability on campus. Three sustainable development perspectives work well. Students created programs based on the number of mapping areas studied and their 15 components. Most students study SDGs 14 and 15 and Indonesia's urban waste problem. Programs address SDG 12 and 13 indicators. Some program problem-solvers use social and environmental perspectives, while others use only environmental perspectives. Most Reflection Observation (RO) learning experience models correctly use abstract concepts. Document studies, Google Doc surveys, observations, and community leader interviews provided data for students. Abstract conceptualization (AC) implements ESD values in experiential learning. Students incorporate SDG issues and indicators. Fieldwork included opinion leaders and the community. CSR and community development in scientific journals, news, and YouTube programs instill ESD values in this course. Several learning materials teach ESD values through value-planting, habituation, and culture. Every meeting includes environmental, social, and economic materials and student assignments.

REFERENCE

- Åhlberg, M., Äänismaa, P., & Dillon, P. (2005). Education for Sustainable Living: Integrating theory, practice, design, and development. *Scandinavian Journal of Educational Research*, 49(2), 167–185.
<https://doi.org/10.1080/00313830500048923>
- Albareda, L., Lozano, J. M., Tencati, A., Midttun, A., & Perrini, F. (2008). The changing role of governments in corporate social responsibility: drivers and responses. *Business Ethics: A European Review*, 17(4), 347–363.
<https://doi.org/10.1111/j.1467-8608.2008.00539.x>
- Anyolo, E. O., Kärkkäinen, S., & Keinonen, T. (2018). Implementing Education for Sustainable Development in Namibia: School Teachers' Perceptions and Teaching Practices. *Journal of Teacher Education for Sustainability*, 20(1), 64–81.
<https://doi.org/10.2478/jtes-2018-0004>
- Avonanova. (2012). *Indonesia Tercatat sebagai Perusak Hutan Tercepat di Dunia*. blogs.itb.ac.id/igist/2012/06/19/indonesia-tercatat-sebagai-perusak-hutan-tercepat-di-dunia/
- Baharudin, & Wahyuni, E. N. (2017). *Teori Belajar dan Pembelajaran*. Ar-Ruzz Media.
- Baker, M., & Robinson, S. (2016). The Effects of Kolb's Experiential Learning Model on Successful Intelligence in Secondary Agriculture Students. *Journal of Agricultural Education*, 57(3), 129–144. <https://doi.org/10.5032/jae.2016.03129>
- Bass, S., Dalal-clayton, B., & Pretty, J. (1995). Participation in Strategies for Sustainable Development. *Environmental Planning Issues*, 7, 1–118.
- Boggu, A. T., & Sundarsingh, J. (2016). The Impact of Experiential Learning Cycle on Language Learning Strategies. *International Journal of English Language Teaching*, 4(10), 24–41.
- Bossel, H. (1999). *Indicators of sustainable development, Theory, method, applications*. The International Institute for Sustainable Development.
- Bozoglu, J., Dos, A., Aires, S., Caldeira, F., & Borem, B. (2016). *Collaboration With Bim: An Experiential Learning Case*. 124, 92–101.
- Chan, C. K. Y. (2012). Exploring an experiential learning project through Kolb's

- Learning Theory using a qualitative research method. *European Journal of Engineering Education*, 37(4), 405–415.
<https://doi.org/10.1080/03043797.2012.706596>
- Godemann, J., & Michelsen, G. (2011). *Sustainability Communication : Interdisciplinary Perspectives and Theoretical Foundation*. Springer International Publishing.
- Husser, J., André, J., Barbat, G., & Lespinet-Najib, V. (2012). CSR and sustainable development: are the concepts compatible? *Management of Environmental Quality: An International Journal*, 23(6), 658–672.
<https://doi.org/10.1108/14777831211262936>
- Iliško, D., & Badyanova, Y. (2014). A Case Study of ESD Implementation: Signs of Sustainable Leadership. *Discourse and Communication for Sustainable Education*, 5(1), 38–48. <https://doi.org/10.2478/dcse-2014-0004>
- Kemendikbudristek. (2011). *Education Guidelines for Development and Sustainable Development*. Directorate of Basic Education, Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi.
- Kemp, S. (2011). *Embedding experiential learning into the curriculum and linking to extra-curricular activities*.
- Manolas, E., & Littleddyke, M. (2010). Enriching understanding and promoting responsible behaviour to combat climate change: A case study involving the use of Kolb's experiential learning model. *Proceedings of the 7th International Conference on Hands on Science, HSci 2010 - Bridging the Science and Society Gap*, 131–137.
- Novak, J. D. (2010). Learning, Creating, and Using Knowledge. In *Routledge* (Second Edi). Routledge Taylor & Francis Group.
- Novak, J. D., Gowin, D. B., & Kahle, J. B. (1984). *Learning How to Learn*. Cambridge University Press. <https://doi.org/10.1017/CBO9781139173469>
- Quesada-Pineda, H. J., & Haviarova, E. (2014). Incorporating Experiential Learning and Education for Sustainable Development into Study Abroad Programs. *Natural Sciences Education*, 43(1), 127–136. <https://doi.org/10.4195/nse2014.04.0010>
- Rogers, C. (1969). *Kebebasan untuk Belajar*. Charles E. Merrill.
- Ssossé, Q., Wagner, J., & Hopper, C. (2021). Assessing the Impact of ESD: Methods, Challenges, Results. *Sustainability*, 13(5), 2854.
<https://doi.org/10.3390/su13052854>
- Tomaškinová, J., & Tomaškin, J. (2018). Cross-Cultural Experiential Learning During the Short-Term Non-formal Educational Activity. In *World Sustainability Series* (pp. 129–141). https://doi.org/10.1007/978-3-319-63534-7_9
- UN. (1992). UN Conference on Environment and Development - Agenda 21 – Chapter 36 (Promoting Education, Public Awareness and Training). In *United Nations* (Issue June, pp. 320–328).
- UNESCO. (2005). *International implementation scheme and UNESCO. Contribution to the implementation of Decade*. UNESCO.
- UNESCO. (2006). *Education for sustainable development toolkit*. UNESCO.
- UNESCO. (2010). *Education for sustainable development*. UNESCO.
<http://unesco.org/en/esd/>
- Voukelatou, G. (2019). The Contribution of Experiential Learning to the Development of Cognitive and Social Skills in Secondary Education: A Case Study. *Education Sciences*, 9(2), 127. <https://doi.org/10.3390/educsci9020127>