

# ESD-SDGs IN TEACHING AMONG GEOGRAPHY TEACHERS

*Pengajaran ESD-SDGs dalam Kalangan Guru Geografi*

MOHD ZAKI SAID<sup>1</sup>, NOR ASNIZA ISHAK & MOHAMMAD ZOHIR AHMAD @ SHAARI<sup>2</sup>

<sup>1</sup>School of Educational Studies, Universiti Sains Malaysia (USM), Pulau Pinang, Malaysia

<sup>2</sup>Faculty of Human Sciences, Universiti Pendidikan Sultan Idris (UPSI), Perak, Malaysia

\*Corresponding author: [mohdzakisaid2021@gmail.com](mailto:mohdzakisaid2021@gmail.com), [asnizaishak@usm.my](mailto:asnizaishak@usm.my), [zohir@fsk.upsi.edu.my](mailto:zohir@fsk.upsi.edu.my)

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**ABSTRACT** Education for Sustainable Development (ESD) is an important agenda in schools towards the Sustainable Development Goals (SDGs) and to achieve UNESCO's 2030 Agenda. Both conceptual frameworks, ESD-SDGs are implemented in pedagogic activities and important to the achievement of the SDGs. The purpose of this study is to measure ESD-SDG concept in teaching, among Geography teachers. A quantitative study was conducted involving 252 samples from 350 Geography teachers in Penang through a survey method. The findings based on mean score showed as "often" carried out by Geography teachers in term of "experiential-learning (active) approach" ( $M=3.95$ ,  $SD=0.809$ ), "real-world learning approach" ( $M=3.40$ ,  $SD=1.065$ ) and "critical-problem solving learning approach" ( $M=3.53$ ,  $SD=1.011$ ). Geography teachers implemented the "experiential-learning (active) approach" in teaching by "Emphasis on sustainable living", "Cultivate the value of appreciating all life and nature" and "Spread the ideals of harmony, peace, and respect for one another". Furthermore, teachers choose "sometime" in implementing the global citizenship project based on the "Real-world learning approach". As a worldwide need to teach and promote students about sustainable development (SD) in line with SDG4.7, the findings of the study show that the pedagogical approach to sustainable development towards the implementation of the ESD-SDGs concept is insufficient and needs to be improved especially students-centered learning (SCL) in the teaching approach.

**Keywords:** Education for Sustainable Development, Pedagogy for Sustainable Development, Sustainable Development Goals, Student-Centered Learning (SCL)

## 1. Introduction

In line with global needs, the world is working to achieve the Sustainable Development Goals (SDGs) which are targeted to be achieved by 2030 after the end of the Millennium Development Goals (MDGs) in 2014. According to Sachs (2012), the SDGs turn to important things based on global concerns about environmental,

economical and social aspects. The SDGs contain 17 goals and 169 SDG targets which aim to overcome the various and complex problems faced by humans (Pradhan et al., 2017). The SDGs are also the focus of the United Nations Development Program (UN) for the period between 2015 to 2030 which integrates, unites and balances the three dimensions of sustainable development (SD) which includes areas in economics, social and environmental as shown in figure 1.0.

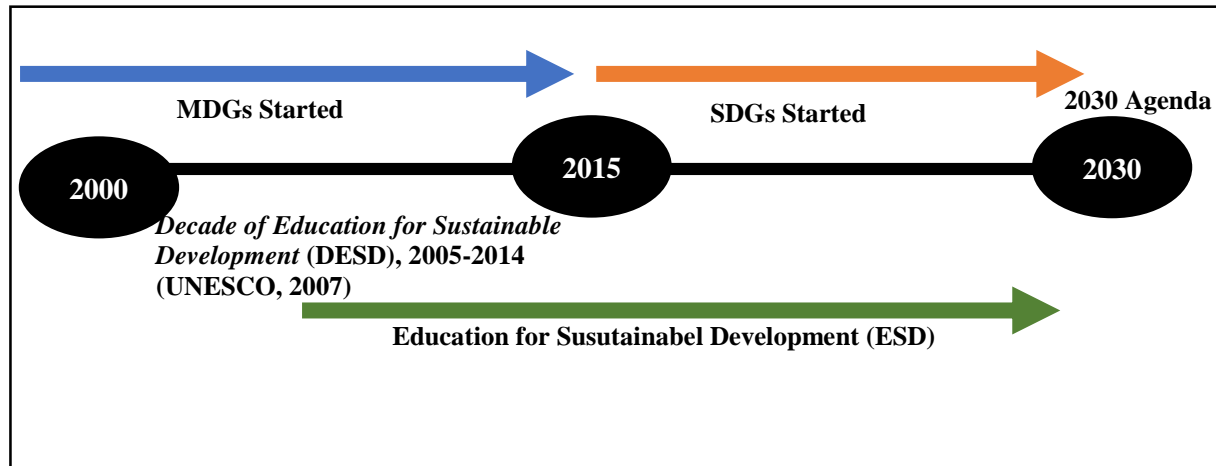


**Figure 1.** *Seventeen Goals of Sustainable Development Goals (SDGs)*

Education for Sustainable Development (ESD) is not new in education. ESD is the learning necessary to maintain and improve our quality of life and the quality of life of future generations that includes knowledge, values and skills that require everyone to be involved and to make decisions either individually or collectively in a local or global context for the improvement of the quality of life now without destroying the planet for the future (Sustainable Development Education Panel Report, 1998). The United Nations (UN) in December 2002 through Resolution 57/254 proposed the Decade of Education for Sustainable Development (DESD), 2005-2014 (Grabovska and Grabowski, 2009) which outlined the approach of Education for Sustainable Development (ESD) in DESD (2005). One of DESD's goals is to improve Education for Sustainability (EfS) which involves teaching the effectiveness of Environmental Education (EE) in order to improve the environment. ESD is a necessity to change the role of education for global development as a core to the well-being and future of individuals and the earth (UNESCO, 1992).

In education, ESD activities will determine the success of the SDGs agenda (UNESCO, 2015). But, ESD in the SDGs is an inseparable concept in school. The relationship between ESD and SDGs or ESD-SDGs can be seen as a continuous effort in the field of education from the idea of MDGs to SDGs as shown in Figure 2.0. Meanwhile, Schee (2016) states that SDG4 which is Quality Education can link to other

goals in the SDGs through Geography subject in school. Teacher Competence in ESD can be developed through Teaching and Learning Innovation (PdPI) which determines the ability of teachers to help students develop sustainable competence in the classroom (UNESCO, 2017).



**Figure 2.** Timelines of the Millennium Development Goals (MDGs), Sustainable Development Goals (SDGs) and ESD

Source: Adapted from Griggs et al. (2013)

## 2. Literature Review

ESD-SDGs in teaching refers to teacher's pedagogy where the integration, application, or direct teaching activities linked to Sustainable Development are carried out in the Learning and Teaching (PdP) process. Pedagogy in Sustainable Development (SD) focuses on increasing competence and changing student behavior (Redman, 2013). The three pedagogical approaches to Sustainable Development (SD) are "real-world learning", "critical problem solving", and "experiential learning" (Redman, 2013; Brundiers & Wiek 2011; Segalàs et al., 2010; Hmelo-Silver, 2004).

According to Taimur (2020), the "real world learning" approach is a method of instruction that integrates theory into practice and develops interpersonal skills based on learning objectives that are also focused on the context of the students' surrounding. Brundiers et al. (2010), proposed a real-world learning approach that is through lectures, storytelling, visits, student exchange, role-playing, reality-based games and project-based learning. Meanwhile, critical problem-based learning is proposed to deal with sustainability problems (Taimur, 2020). UNESCO (2012) presents an approach based on problem solving which is through class discussion and problem analysis. Finally, for the Sustainable Development Pedagogy (SD) approach is through active or experience-based learning that is highlighting teachers as a model of sustainable behavior and the promotion of sustainability actions based on activities at school (Redman, 2013). The ESD activities in pedagogical approach includes role playing and simulation activities, group discussion (Cotton, 2006), stimulus activities

(Oulton et al., 2004), debate, case study, critical reasing and writing (Stibbe, 2007), problem-based leraning and fieldwork activities (Scott and Gough, 2003).

A study by Aye et al. (2019) showed that teaching skills to integrate ESD among primary and secondary teachers in Myanmar are unsatisfactory, but for Science, it is higher considering that Science is very close to ESD elements compared to Geography. According to Nguyen et al., (2021), the integration of ESD in the curriculum is not enough to promote SD. Mohd Zaki & Mohammad Zohir (2021), an effective learning and teaching process (PdP) is important to produce knowledgeable and skilled students to promote SD.

### 3. Research Methodology

In this research, a quantitative method was choosen to measure ESD-SDGs activities of Geography teachers. There were 350 teachers who taught Geography in Penang, Malaysia in secondary schools. The sampling procedure was determined through on cluster sampling involving teachers who teach Geography subject. The sample size was 252 respondents overall, with 58 males (23%) and 194 females (77%) exceeding the minimum need of 186 respondents based on Krejcie and Morgan (1970). Based on Table 1, the majority of the respondents were specializing in the Geography option, namely 159 teachers (63.1%) and the remaining 93 teachers (36.9%) were non-option teachers. In addition, 152 respondents (60.3%) have more than 10 years teaching experiences and 26 respondents (11.3%) considered as below 4 years teaching experiences in Geography. In addition, 152 respondents (60.3%) have more than 10 years of teaching experience and 26 respondents (11.3%) are considered to have less than 4 years of teaching experience in Geography.

**Table 1.**

*Profile respondents*

Profile Respondents		N	%
1. Gender	Male	58	23.0
	Female	194	77.0
2. Group of teachers	Option Geography	159	63.1
	Non-option Geography	93	36.9
3. Teaching Experiences	Less than 1 years	3	1.2
	1-3 years	26	10.3
	4-10 years	71	28.2
	More than 10 years	152	60.3

The 20 items on the questionnaires were taken from UNESCO (2005) and matched the pedagogical approach to Sustainable Education (SE) proposed by Redman (2013). There were five points on the Likert scale: 1 (never), 2 (extremely rarely), 3 (sometimes), 4 (often), and 5 (very frequently). With an I-CVI value of 0.85, which is considered high instrument validity and aligns with Zamanzadeh et al. (2015), above 0.79, all the items met the validity threshold. In addition, the

instrument's reliability test yielded a high instrument consistency, with a Cronbach's Alpha value of more than 0.938 among the 85 respondents in the pilot study. A reasonable degree of reliability is defined as having a reliability coefficient value between 0.75 and 0.90, based on Amin Al Haadiet et al. (2017).

The data was analyzed and expressed in terms of means dan standard deviations (SD) by using Statistical Package for Social Sciences version 27. As indicated in Table 2, there were five possible interpretations for the mean score of each item: "Always" (score range: 4.20 or more), "often" (score range: 4.19 to 3.40), "sometime" (score range: 3.39 to 2.60), and "never" (scoring range: <1.80).

**Table 2.**

*Interpretation of Mean Score*

Score Mean (M)	Interpretation	Conclusive Interpretation
1.00 – 2.79	Never	The sample never implemented activity of ESD-SDGs.
1.80 – 2.59	Rarely	The sample rarely implemented activity of ESD-SDGs.
2.60 – 3.39	Sometime	The sample sometime implemented activity of ESD-SDGs.
3.40 – 4.19	Often	The sample often implemented activity of ESD-SDGs.
4.20 – 5.00	Always	The sample always implemented activity of ESD-SDGs.

#### 4. Finding and Discussion

The "real-world learning" approach revealed the mean score at the level of "Often" and "Sometime" for nine learning approaches, which are also displayed in Table 3. The results for the five real-world learning approaches were as follows: the educational drama (M=3.18, SD=1.172); Bring in a knowledgeable expert (M=2.84, SD=1.294); Examine a range of sources and materials in groups.(M=3.40, SD=1.045); field studies (M=3.34, SD=1.169); and the global citizenship project (M=2.90, SD=1.301) all had mean scores at the level of "Sometime." Additionally, the results indicate that, the scores as "Often" in case studies (M=3.48, SD=1.035), role plays (M=4.00, SD=0.771), story telling (M=4.00, SD=0.771), and discover-base learning through exploration (M=3.53, SD=0.957). The global citizenship project demonstrated that a comparatively big standard deviation (SD) value indicates that the data distribution is relatively remote from the mean score or the data point that falls from the center.

**Table 3.***The real-world learning approach*

Approaches (N=252)	Mean (M)	Standard Deviation (SD)	Interpretation of Mean Score
1. Story telling	4.00	0.771	Often
2. Educational drama	3.18	1.172	Sometime
3. Role-play technique	3.40	1.045	Often
4. Bring in a knowledgeable expert	2.84	1.294	Sometime
5. Examine a range of sources and materials in groups.	3.48	1.035	Sometime
6. Case studies	3.42	1.074	Often
7. Discovery-based learning through investigation	3.53	0.957	Often
8. Field studies	3.34	1.169	Sometime
9. Global citizenship project	2.91	1.301	Sometime

Meanwhile, the "critical-problem solving" approach also revealed the mean score at the level of "Often" for seven learning issues, which are also displayed in Table 4 and include "presentation session" (M=3.84, SD=1.081), "debate sessions" (M=3.55, SD=0.986), "assignments" (M=3.78, SD=0.890), "inquiry learning" (M=3.59, SD=0.939), "peer-to-peer teaching" (M=3.39, SD=1.089), "internet resources exploration." (M=3.68, SD=0.981) And "discussion" (M=3.39, SD=0.939).

**Table 4.***The critical-problem solving learning approach*

Approaches (N=252)	Mean (M)	Standard Deviation (SD)	Interpretation of Mean Score
1. Presentation session	3.48	1.081	Often
2. Debate sessions	3.55	0.986	Often
3. Assignments	3.78	0.890	Often
4. Inquiry learning	3.59	0.939	Often
5. Peer-to-peer teaching	3.25	1.111	Often
6. Internet resources exploration	3.68	0.981	Often
7. Discussion	3.39	1.089	Often

The experiential-learning (active) issues in this study were rated as "Often" based on mean scores for the following issues: "emphasis on sustainable living" (M=4.12, SD=0.683); "Be a role model of sustainability and the environment." (M=4.05, SD=0.76); and "cultivates the value of appreciating for all life and nature" (M=4.40, SD=0.621) for the following issues. These results are displayed in Table 5.

**Table 5.***The experiential-learning (active) approach*

Approaches (N=252)	Mean (M)	Standard Deviation (SD)	Interpretation of Mean Score
1. Be a role model of sustainability and the environment.	4.05	0.760	Often
2. Emphasis on sustainable living in Teaching and Learning (T&L)	4.12	0.683	Often
3. Cultivate the value of appreciating all life and nature.	4.40	0.621	Always
4. Spread the ideals of harmony, peace, and respect for one another.	4.28	0.680	Always

Overall the findings demonstrate that the the mean scores of “Often” based on pedagogy for sustainable development approach in “experiential-learning (active) learning” (M=3.95, SD=0.809), “real-world learning approach” (M=3.40, SD=1.065) and “critical-problem solving learning approach” (M=3.53, SD=1.011) as indicated in Table 6.

**Table 6.***The pedagogy for sustainable development approach*

Approaches (N=252)	Mean (M)	Standard Deviation (SD)	Interpretation of Mean Score
1. Experiential-learning (active)	3.95	0.809	Often
2. Real-world learning	3.40	1.065	Often
3. Critical-problem solving learning	3.53	1.011	Often

Research on ESD-SDGs activities based on pedagogy for sustainable development learning approach show that geography teachers frequently employed active learning, or experiential learning, in place of critical problem-solving or real-world learning. As part of the experiential learning approach, teachers frequently emphasize sustainable living in geography lessons and serve as role models for students by modeling environmentally conscious and sustainable conduct. During the teaching and learning (T&L) process, teachers consistently demonstrate their appreciation for all living creatures and the natural world. They also consistently uphold the values of harmony, peace, and respect for one another. Teachers of geography have a preference for using the strategy of fostering, developing, and stressing Sustainable Development (SD) issues when doing teacher-oriented or learning-based activities.

In the real-world learning approach, Geography teachers often adopt storytelling, role-playing technique, and carry out case studies and conduct

discovery-based learning through investigation. Geography teachers sometimes, bring skilled professionals to school to carry out the global citizenship projects. The finding showed that Geography teachers had less experience with the ideas of global citizenship projects. In the meanwhile, teachers are paying less attention to the strategy of inviting in qualified experts and conducting the global citizenship projects. Before this activity can be carried out in the school, the school has to go through some formalities and bureaucracy procedures involving outside parties.

In addition, this study indicates that the ESD-SDGs activities have yet to receive great attention, to be implemented in Learning and Teaching (T&L) among Geography teachers. It is a challenge to ensure that ESD is implemented in line with the SDGs agenda to achieve the global goals of Agenda 2030 by changing the pedagogical approach from teacher-oriented to student-learning oriented, especially to the education system, teacher leadership and Geography teachers. In this field, further studies are needed to identify the issues of implementation of activities of ESD-SDGs among Geography teachers in schools.

As a result, the findings of the study show that geography teachers have not yet enough in implementation of ESD-SDGs activities in learning and teaching (P&P). It is a challenge job for Geography teacher to ensuring that ESD is implemented in a way that aligns with the SDG agenda and achieves the global goals of Agenda 2030 by shifting the strategy from teacher-centered to student-learning oriented. To determine the implementation of ESD-SDG activities among geography teachers in schools, more studies in this field are needed to overcome the issues and it will help teachers to achieve the global requirement.

## **5. Conclusion**

The study shows that Geography teachers at the "often" level in carrying out the activities of "approach to learning through experience", "Approach to solving learning problems" and "Approach to learning critical problem solving". The findings of the study also show that geography teachers rarely bring in skilled experts or undertake global citizenship project issues compared to other approaches. In addition, when it comes to the issue of student-centered learning (SCL), teachers prefer to use teacher-centered learning (TCL) for activities. In addition, based on this study, teachers have yet to implement ESD-SDG activities that can be used in the classroom as a teaching strategy or as a global need to teach students about SDGs in preparation for Agenda 2030, UNESCO. So, a change in approach is very important especially when teachers plan their lesson plans by implementing pedagogy for sustainable development.

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