PART 5

***Toward Empowering Teachers as Agents of
Climate Action***

ESD in Malaysia

Challenges and Strategies

Pravindharan Balakrishnan

Abstract

The need for education for sustainable development (ESD) in Malaysia today is even greater than ever, because the country continues to face burgeoning environmental challenges. However, ESD has not been clearly spelled out in the education landscape to date.

This chapter explores the challenges of, and strategies for, the implementation of ESD in Malaysia. It draws on both my personal experience as a teacher and on analysis of documents. Fifteen existing studies provided insights into implementation of ESD in Malaysia. Their analysis was supported by a document analysis of the Malaysian Education Blueprint, which is a key document in the Malaysian education system.

The findings revealed three challenges: the dominating role of examinations; the top-down nature of the education system; and student outcomes. All reflect systemic gaps in ESD. In light of these challenges, the chapter proposes three strategies to use in pushing for ESD: empowering teachers to be ESD drivers; tailoring ESD to fit into the Malaysian education context; and broadening the existing Sustainable School Environment Award (SLAAS) program. The chapter concludes that although radical transformation of education is essential for ideal ESD to take place, the three strategies could enable ESD to thrive to a certain extent even in the current rigid and exam-dominated Malaysian education system.

Keywords

education for sustainable development – Malaysia – Sustainable School Environment Award Program – teachers

1 Introduction

The need for education for sustainable development (ESD) in Malaysia is greater than ever today, as the Southeast Asian country continues to face burgeoning environmental change. Malaysia's transition in the last two decades from an agricultural to a manufacturing-based economy has had significant impact, in terms of major structural transformation and notable social changes (Begum et al., 2011). During these two decades, the economy diversified into urban-based services and labor-intensive industry (Sachs, n.d.). Notable social changes include reduced poverty, extended education, and improved general health and longevity.

Needless to say, all these rapid developments, coupled with widespread capitalism, have adversely affected the natural environment. A study by Koh (2007) revealed that Malaysia experiences the highest rate of deforestation of any developing Southeast Asian country. Rahman (2009) said that the temperature in Malaysia is projected to increase by 1.5 degrees Celsius by 2050 because of environmental degradation. Such an increase would lead to changing climate patterns, which would result in severe floods, agricultural loss, and other pressing environmental issues.

Recently, plastic waste has become a major issue. In a ranking of the world's countries that have mismanaged plastic waste, Malaysia ranks eighth (Ministry of Energy, Science, Technology, Environment, and Climate Change, 2018). This development led the previous government to draw up a roadmap pushing for zero single-use plastics in Malaysia by 2030.

With plastics pollution growing at an alarming rate, Malaysia also struggles with the mushrooming of illegal plastics recycling factories (Vijandren, 2019). After China banned imports of plastic waste in the beginning of 2018, Malaysia became the world's alternate importer (Ananthalakshmi & Chow, 2019). The plastic waste business presented a dilemma for Malaysia. Whereas the use of the industry's low-end technology harms the environment (Othman & Ariff, 2019), the country could gain, it is reported, 3.5 billion Ringgit (US \$827 million) from the plastics waste business (Ananthalakshmi & Chow, 2018).

These examples suggest the tension that exists between capitalism and environmental change in Malaysia. The situation highlights the urgent need for quality education revolving around climate change, both locally and globally.

The notion of sustainable development has existed in Malaysia's education policies ever since the Third Malaysia Plan (1976–1980). Although discussion of ESD appears in educational policies and plans (Mokshein, 2019), to date ESD has not been clearly spelled out or adapted to the specific Malaysian context. As a citizen and a teacher, I decided to study the situation regarding ESD

in Malaysia, starting with a close examination of the Malaysian Education Blueprint by the Ministry of Education Malaysia (2013), which is considered a major document in driving education reform in the country (Aai, 2014), with its goal of mapping the future of education in Malaysia. It lays out 11 specific, rigorous shifts from current practice, all designed to provide equitable and quality education for all Malaysians in three waves: Wave 1 (2013–2015); Wave 2 (2016–2020); and Wave 3 (2021–2025).

I also analyzed earlier document, having identified a total of 15 past studies that provided insights into the challenges of, and strategies for, implementing ESD in Malaysia. I also sought out reports of initiatives oriented toward ESD that have already been implemented in Malaysian schools.

Also informing this study were a number of journal articles. Especially influential were the report “Roadblocks to Quality Education in a Time of Climate Change” by Christina Kwauk (2020), and an online workshop featuring Christina Kwauk and Radhika Iyengar called “Charting an SDG 4.7 Roadmap for Radical Transformative Change in the Midst of Climate Breakdown” (Center for Sustainable Development, 2020).

This chapter aims first to explore the challenges that quality ESD faces in the Malaysian education system. It then describes initiatives already taken to promote environmental education and sustainable development in Malaysian classrooms and finally offers suggestions for ways to further approach ESD in Malaysian schools. The hope is that the document analyses, along with my own thoughts as a teacher, can provide a granular and nuanced understanding of how ESD is positioned in Malaysian schools and of what can be done to push for quality education in this time of climate change.

2 Roadblocks and Challenges

Kwauk (2020), identified five roadblocks that impede the education sector in general from promoting quality climate education. My document analyses and my teaching experience identified three challenges in Malaysia that resonate with Kwauk’s roadblocks. They are as follows.

2.1 *An Exam-Oriented Education System*

A big challenge in implementing ESD is the dominant role of examinations in the Malaysian education system. Assessments are central to it, although in recent years some attempts have been made to move away from an exam-centric system. A core reason driving policy reforms related to national assessment is Malaysia’s poor performance in international large-scale assessments,

particularly the Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) (Chin et al., 2019).

In Malaysia, typically public assessments take place at the end of primary school (age 12), at the end of lower secondary (age 15), and at the end of secondary school (age 17). Before recent reforms, the national examinations tested chiefly content knowledge, focusing on regurgitation of facts rather than on real-life applications. After the education system was criticized for failing to produce citizens for the 21st century workforce, the education ministry reinvigorated the curriculum and shifted the focus of examinations, incorporating analytical and higher-order thinking skills (Ministry of Education Malaysia, 2013).

In a further attempt to be more holistic, the Ministry of Education introduced school-based assessments. In addition, national assessments began taking into account students' physical activity, sport, and co-curricular assessment, devoting 10% of the total score to these. And in the meantime, a psychometric assessment was introduced to determine a student's suitability for the two main upper secondary streams – arts or science (Ministry of Education Malaysia, 2013) – upon completion of lower secondary schooling.

Besides attempting to move away from an exam-centric system, the Blueprint also emphasized the great need for a focus on science and mathematics in order to build human capital for the knowledge-driven economy, and it increased instructional times for both subjects, thereby demonstrating that the education system prioritizes one type of knowledge over another. Although the ministry attempts to move away from examinations, my classroom experience tells me that the assessments culture continues to dominate the school experience of Malaysian students, particularly final year students who will sit for the national Malaysian Certificate of Education. Grades from the final year examination determine most aspects of the student's future as a student, from scholarships to course placements.

The huge role of exams influences what happens in the classroom. Teachers continue "teaching to the test". Mustam and Daniel (2018) note that infusion of environmental education in the curriculum is not given priority. Teachers lean toward academic learning for examination as opposed to inquiry learning for enrichment. Elements such as ESD could be deemed distractions, burdensome for both teachers and students.

2.2 *The Top-Down Nature of the Education System*

The second challenge in implementing ESD in the Malaysian context is the top-down nature of the Malaysian education system. Education in Malaysia

is heavily centralized. The teacher's daily classroom routine is subject to what the Ministry of Education has laid out and conveyed to the school administration (Lee, 2006). In terms of ESD, the Blueprint gives it no attention, but it is rather, as Aai (2014) notes, "conveniently absent" (p. 207). This negative attitude percolates down to the school administrations, which play a role in managing the daily activities at schools. To the extent that ESD programs exist in schools, Abdul Ghani and Aziah (2007) establish in Hanifah et al. (2015) that school administrations have limited knowledge as to how to carry them out. As a result, skills are limited and integration lacking in any implementation of ESD-based programs (Aminrad et al., 2012). Teachers themselves are restricted from conducting ESD activities in their own classrooms.

The National Philosophy of Education, which was formulated in 1988 and revised in 1996, likewise includes no elements of sustainable education.

Education in Malaysia is an ongoing effort towards further developing the potential of individuals in a holistic and integrated manner, so as to produce individuals who are intellectually, spiritually, emotionally, and physically balanced and harmonious, based on a firm belief in and devotion to God. (Ministry of Education Malaysia, 2013, p. E-8)

Close to three decades after it was written, this philosophy does not entirely reflect the changing world we currently live in.

The Blueprint explicitly assigns education a role "in providing a foundation for national building and sustainable economic growth in line with Malaysia's goal of transforming into a high-income nation" (Ministry of Education Malaysia, 2013, pp. 1–8). Aai (2014) establishes that education in Malaysia is geared toward a neoliberal epistemology (or theory of knowledge), in line with the view that education is organized to produce Malaysians for the competitive knowledge economy. Sadly, this approach means that environmental education or ESD are not given priority, as it is assumed that they do not contribute to economic growth. Again, the lack of ESD discourse in the Blueprint lines up with the way those at the ministerial level regard ESD. Their attitude percolates down to the school administrations, then trickles down further to teachers in the classroom.

In my experience, a teacher who is not consciously aware of ESD issues would not likely integrate ESD concepts and values into their lessons. Kamis et al. (2017) found likewise that teachers indeed face difficulty teaching green skills to students if they are not themselves equipped with such knowledge. There needs to be some form of capacity building in order to push for ESD learning. As far as I know, there are few or no professional development courses

for in-service teachers that focus particularly on ESD. Aminrad et al. (2012) recommend that the education system invest more in teachers who are involved in environmental education and that it should do so by acknowledging the role of teachers in creating public awareness and influencing student understanding. Representing a different view as to teacher training, Lateh and Muniandy (2010) assert that environmental education *is* offered in teacher training institutions and is designated a compulsory subject for post-graduate teacher training courses. They say that bachelor's degree programs in education require their students to take "physical and human environmental education which provides 4 credits with 60 hours' teaching period" (Lateh & Muniandy, 2010, p. 1897). Lateh and Muniandy (2010) infer that because teacher training institutions are responsible for teaching, guiding, and exposing trainee teachers with regard to environmental education and its relevance, that trainee teachers are likely to be equipped with the necessary knowledge on environmental education and are likely to teach it at school level in the future. Their conclusion invites further investigating as well as updating, as since they wrote, things might have changed in the direction of either added or reduced emphasis on environmental education in teacher training institutions. Nevertheless, it remains true that in top-down systems, it is vital for those who occupy the "top" to make the necessary shifts in order for changes to take place at the bottom. In order for ESD to thrive in such education systems, governing educational bodies need to reevaluate the value and priority of ESD in their own societies.

2.3 *Students' ESD Outcomes Reflect Gaps in ESD*

The third and final challenge identified through document analysis and my experience is that students' outcome on ESD values and concepts reveal big gaps in ESD (Aini et al., 2007; Othman & Yahaya, 2011). A study by Noordin and Sulaiman (2010) of 340 secondary school students revealed that students possessed relatively low levels of knowledge, values, and participation in matters related to sustainable development. Parallel with that study, Mumtazah and Norhafidah (2009) found out that 67.7% of 1524 Form 4 students (age 16) had no knowledge regarding sustainable consumption. Another study by Aminrad et al. (2013) of 470 16-year-old students revealed that, as one would suspect, improved environmental education leads to increased awareness and better attitudes regarding environmental issues. The study showed that on environmental issues, a significant but weak relationship exists between awareness and knowledge. But it showed a strong relationship between awareness and attitude. In light of the study results, the authors recommend that environmental education might consider having its own syllabus in the Malaysian education system.

Findings from these studies, showing gaps in environmental knowledge, are not surprising, as they reflect the nature of the education system and its two above-mentioned challenges – its emphasis on examinations and its top-down character.

Education for sustainable development is not altogether absent from the Malaysian national education system. Its inclusion begins in upper primary (ages 9 to 12). Students receive environmental education in geography for another three years in lower secondary (ages 13 to 15). When they reach upper secondary and choose among three main streams – academic (science or arts), vocational, and religious – geography becomes elective. Typically, at this stage, environmental education is neglected, as students focus on their selected streams and final national examinations and teachers teach to the test. The negative blowback from the system of assessments thus contributes to students' low comprehension of environmental issues.

Nonetheless, recent studies seem to show that students' awareness of environmental issues is trending slightly upward. Abdullah et al. (2017) found in their research that primary school students generally perceive the environment positively and that they understand its importance for the future generation. Razak et al. (2019) found that science-stream students have more positive attitudes toward environmental protection than do non-science-stream students (likely because their subjects convey more environmental information). This finding also justifies the view that knowledge and awareness enable positive attitudes and values to emerge.

Finally, a study on trainee teachers showed that as they came to understand the definition of environmental education and its importance, the results were positive (Lateh & Muniandy, 2010). Lecturers from teacher training institutions also noted that lectures on environmental education went smoothly when conducted with a syllabus provided by the Teacher Education Division (Lateh & Muniandy, 2010). Lateh and Muniandy (2010) emphasize that environmental education should be “entrenched in our education system”, articulating the growing need for a proper environmental education syllabus, or ESD for that matter, to be implemented in schools.

3 Strategies for Improvement

Having discussed three challenges impeding ESD in Malaysian schools, we come to a discussion of three strategies that can be employed to improve and enhance the roadmap for ESD in Malaysia.

3.1 *Empowering Teachers to Be Drivers of ESD Learning*

To respond to the challenges described above, the first strategy that can be employed to provide quality education is to empower teachers to be drivers of ESD in classrooms. Without doubt, ESD in Malaysian schools is not fully “optimized”. Saravanan et al. (2013) in Mahat and Idrus (2016) showed that students’ understanding of sustainable practices were short-term and that they could not relate to ESD in the long term. This finding suggests that students’ knowledge of ESD starts and ends in the classroom and is thus wholly driven by teachers. Mahat and Idrus (2016) also indicate that student behaviors reflect those of their teachers. Thus, a teacher’s attitude toward, and knowledge of, the environment can be a strong influential factor in driving ESD in the classroom. Kamis et al. (2017) also emphasize the role of the teacher in bringing about changes in students’ attitudes and behaviors concerning the environment. Their research underscored that teachers need to be specifically trained in sustainability and environmental education in order to maximize learning outcomes (Kamis et al., 2017).

A study by Mustam and Daniel (2018) similarly indicated that an infusion of environmental education in schools can promote pro-environment behaviors, again justifying the role of teachers as ESD drivers. The study concluded that whereas parents play an instrumental role in building awareness of environmental issues informally, education in a formal school setting is likely to yield better results because it is “effective, organized, and planned” (Mustam & Daniel, 2018, p. 17). As Mahat and Idrus (2016) put it, teachers are the main drivers of ESD in the classroom and “are seen as effective change agents” (p. 78). A study by Lateh and Muniandy (2010), similarly found that because the role of a teacher is crucial in delivering environmental education classes, it was paramount for teacher training institutions to prepare trainee teachers well in terms of environmental knowledge.

Malaysian teachers do indeed lack systemic support to become change agents of sustainability. As discussed earlier, in top-down education systems, teachers need to be encouraged and supported in carrying out ESD activities in the classroom. In my teaching experience, since classroom activities are highly geared toward completing the syllabus and teaching toward the national assessment, not much space is allocated to critical discussions on pressing environmental issues, and even when environment-related issues are brought up, they usually involve only low-impact actions, such as recycling and energy-saving tips, or in other words, mere surface-level awareness of ESD issues.

I believe that given the right support, which includes capacity building, autonomy, and funding, ESD-based activities will flourish in the Malaysian classrooms. However, it is important to note that ESD is a broad term and can

be quite problematic for teachers. The need for less definitional ambiguity leads to the second strategy, because ESD itself needs to be further adapted to the Malaysian context in order for Malaysian teachers to be able to break down its meaning into concrete components and transform them into comprehensible learning experiences for their students.

3.2 *Adapting ESD to the Malaysian Context*

Currently, environmental themes are “contextualized” in the Malaysian education system in the form of green-focused educational competitions. Usually organized as partnerships with universities and private entities, the increased visibility of these green innovation competitions provides an avenue to expose students to environmental issues. A quick chat with Dr. Suhaiza Said, a science teacher and president of the Terengganu chapter of the Science, Technology, Engineering, and Mathematics (STEM) Association, and Mohd Nazrin Haikal, an English teacher in a Malaysian national school, confirmed that, indeed, there is a predisposition these days in favor of environment-themed competitions. They are considered relevant and timely, given that environmental degradation is a current global issue.

However, Dr. Suhaiza Said added, these competitions incorporate tech-based innovation that focuses on technical skills, such as coding. In other words, these competitions focus on the technological side of green skills rather than on ESD in the traditional sense. While a technical focus might contribute to students’ innovative skills and expand green tech, participating students usually constitute only a small set of academic elites from elite schools. These competitions leave behind a large group of students. To maximize students’ awareness of environmental issues, programs or competitions should be inclusive for students of all levels.

Competitions are easy for schools to embrace, much easier than actual ESD lessons. For one thing, competitions last only a short time, at most two months. For another, they come with monetary awards and recognition. For another, preparation for competitions takes place outside normal school hours. Teachers thus remain free to spend instructional hours preparing students for assessments as usual, a situation that does nothing to challenge the status quo that contributes little environmental awareness and practice.

ESD needs to be tailored to work within the framework and context of the current education system in Malaysia in order for it to thrive and not simply be reduced to a series of competitions among a small number of students. Aminrad et al. (2012) note that some components of environmental education already make appearances, as we have mentioned, in various parts of the existing educational systems, not only in secondary school geography classes,

some of which are for everyone and some elective, but also in English, Malay, biology, and other subjects. However, this degree of ESD presence has proven ineffective. According to Aminrad et al. (2012), great gaps exist in the public's awareness of environmental awareness. They suggest that it would be more effective to teach environmental education as one independent subject, rather than it making superficial appearances in various other subjects.

While doing research for this chapter, I came across a curriculum written in Malay for treating ESD as a discrete subject. It is called "*Asas Kelestarian*", which translates as "Foundational Studies in Sustainability". It covers green architecture, water treatment, and physical waste disposal. It also touches on environmental policies and sustainable building. The curriculum surprised me, as I have been a Malaysian national schoolteacher since 2014 and I have never come across anything like this. Sadly, only by chance did I stumble upon it, which shows that such subjects, albeit relevant, are deemed unimportant. Nonetheless, the curriculum indicates existing knowledge of ESD that the education ministry could use in pushing for ESD in Malaysian schools. Understanding that exams continue to dominate the education system, one radical approach the education ministry could take would be to make *Asas Kelestarian* a compulsory subject for all students and incorporate it into the national assessments. While such an approach could be deemed too superficial, it is one way to expand ESD in a form adapted to the existing educational culture in Malaysia.

3.3 *Expanding on the Sustainable School Environmental Award*

The third strategy is to amplify the Sustainable School Environmental Award program (SLAAS). It is a program that was implemented nationwide in 2005 and is open to primary and secondary schools. It is implemented through the collaboration of three parties: the Ministry of Education; the Department of Environment; and the Institute of Environment and Development, National University of Malaysia (Mahat & Idrus, 2016). It was envisioned as a national school competition whose purpose was for schools "to create a school environment that fosters the conservation and preservation of the environment in the aspects of management, curriculum, co-curriculum and continuous green activities in order to establish a life practice in line with the concept of sustainable development" (Mahat & Idrus, 2016, p. 80). As described by Mahat and Idrus (2016), SLAAS seeks to integrate sustainability practices in every aspect of the school setting, ranging from the learning process to the school's relationship with the community.

SLAAS is considered a prestigious national competition. It attracts at least 150 primary and secondary schools annually. The winners are celebrated in

a grand function, with awards presented by ministers from the environment and education ministries. Ten primary and secondary schools are invited to the grand finale, at which the winner receives RM10000 (approximately US \$2,400), a trophy, a plaque, and certificates. In addition, six special awards – Management, Greening Activities, Co-curriculum, Sustainability Cultural Leadership, Sustainability Alliance, and Environmental Friendly Product Innovation – earn their awardees RM1000 (US \$240), a plaque, and certificates (Ministry of Environment and Water, 2018). Schools are motivated to participate in SLAAS not only for the monetary prize, which can be used to improve school facilities, but also for recognition at a national level.

One reason SLAAS has been successful over the years is that teachers see competitions as tangible ways to measure their impact and measure achievement in schools. This feature makes them receptive to picking out such competitions for their students to participate in. Although this attitude does not challenge a neoliberal understanding of sustainability, it is culturally relevant in the Malaysian context and does help ESD values and concepts to thrive to a certain extent.

Since its inception in 2005, the competition has continued to gain momentum among schools, teachers, and students. This upward trajectory lines up with the view of Mahat et al. (2016), who said that environmental education interventions require a consistent period of time in order to see changes in attitudes and behaviors of students. Although the SLAAS program is an example of having exposed ever more students to environmental knowledge and greening activities, it also can be argued that the SLAAS program could be expanded and not restricted to being merely a competition among Malaysian public schools. Hanifah et al. (2015) postulate that schools should not merely look at SLAAS as a competition. Instead, activities from SLAAS could be incorporated in a more holistic manner in order to promote sustainable development.

4 Conclusion

As Kwauk (2020) concludes, in order for ESD to fully take place in schools, there needs to be a radical transformation in education. However, radical transformations may take time, as education systems are static and slow to change. Nonetheless, this paper makes a good case for three measures that can be taken now. First, the role of teachers as ESD drivers needs to be emphasized. As grassroots champions, teachers should be supported and given the autonomy to execute ESD lessons in the classroom, which enables the inclusion of students from all levels. Second, the ESD as a concept has no definitive

scope and is at times filled with ambiguities. Nonetheless, in the Malaysian context, the Ministry of Education could take advantage of the existing subject outline, *Asas Kelestarian* (Foundational Studies in Sustainability), and make it compulsory. Given that our education system is rigid and exam-orientated, making sustainable studies part of the national curriculum is a plausible first step forward in pushing for ESD in Malaysian schools. Third, the ever-growing SLAAS program is a testament to how cross-sectoral coalitions can be used as a possible solution in promoting ESD in schools. It is also popular with teachers as an affirmation of their impact, and even though it does not challenge a neo-liberal focus on preparing workers for the economy, it does have a certain role in promoting sustainability information and values.

These proposed measures are not enough to truly address the urgent need for quality education in such changing times. As Kwauk (2020) says, there needs to be a “radical reimagining of the vision of education that could help reorient schools” (p. 10). As the Blueprint shows, education in Malaysia is geared toward a neoliberal philosophy, structured, as it is, to promote economic growth and to use education as a means to produce highly skilled citizens for the competitive global economy. Similarly, the negative effects of an assessment-driven and top-down education system limit teachers from promoting ESD. Therefore, whatever strategies are adopted have to be culture-specific and able to be executed within the rigid confines of the current education system.

References

- Aai, A. S. (2014). Education for sustainable development in Malaysia's national curriculum reformation: A theoretical exploration. *Journal of International and Comparative Education*, 3(2), 199–212. <https://doi.org/10.14425/00.73.61>
- Abdullah, N. H. L., Hamid, H., Shafii, H., Wee, S. T., & Ahmad, J. (2018). Pupils perception towards the implementation of environmental education across curriculum in Malaysia primary school. *Journal of Physics: Conference Series*, 1049, 012098. <https://doi.org/10.1088/1742-6596/1049/1/012098>
- Aini, M. S., Nurizan, Y., & Fakhru'l-Razi, A. (2007). Environmental comprehension and participation of Malaysian secondary school students. *Environmental Education Research*, 13(1), 17–31. <https://doi.org/10.1080/13504620601122616>
- Aminrad, Z., Sayed Zakariya, S. Z. B., Samad Hadi, A., & Sakari, M. (2012). Environmental education in Malaysia: Progresses and challenges ahead. *Life Science Journal*, 9(2), 1149–1154. <https://doi.org/10.7537/marslsj090212.171>

- Aminrad, Z., Sayed Zakariya, S. Z. B., Samad Hadi, A., & Sakari, M. (2013). Relationship between awareness, knowledge and attitudes towards environmental education among secondary school students in Malaysia. *World Applied Sciences Journal*, 22(9), 1326–1333. <https://doi.org/10.5829/idosi.wasj.2013.22.09.275>
- Ananthalakshmi, A., & Chow, E. (2018, October 29). Plastic waste is good and bad for Malaysia: Here's why. *World Economic Forum*. <https://www.weforum.org/agenda/2018/10/swamped-with-plastic-waste-malaysia-struggles-as-global-scrap-piles-up>
- Ananthalakshmi, A., & Chow, E. (2019, May 21). Malaysia, flooded with plastic waste, to send back some scrap to source. *New Straits Times*. <https://www.nst.com.my/news/nation/2019/05/490387/malaysia-flooded-plastic-waste-send-back-some-scrap-source>
- Begum, R. A., Abidin, R. D. Z. R. Z., & Pereira, J. J. (2011). Initiatives and market mechanisms for climate change actions in Malaysia. *Journal of Environmental Science and Technology*, 4(1), 31–40. <https://doi.org/10.3923/jest.2011.31.40>
- Center for Sustainable Development. (2020, April 29). *Charting an SDG 4.7 roadmap for radical, transformative change in the midst of climate breakdown* [YouTube video]. Earth Institute, Columbia University. <https://www.youtube.com/watch?v=gwc-GOfdKJQ>
- Chin, H., Thien, L. M., & Chew, C. M. (2019). The reforms of national assessments in Malaysian education system. *Journal of Nusantara Studies*, 4(1), 93–111. <https://doi.org/10.24200/jonus.vol4issipp93-111>
- Hanifah, M., Shaharudin, I., Mohmadisa, H., Nasir, N., & Yazid, S. (2015). Transforming sustainability development education in Malaysian schools through greening activities. *Review of International Geographical Education Online*, 5(1), 77–94. <http://www.rigeo.org/vol5no1/Number1Spring/RIGEO-V5-N1-5.pdf>
- Kamis, A., Che Rus, R., Rahim, M. B., Nur Yunus, F. A., Zakaria, N., & Mohd Affandi, H. (2017). Exploring green skills: A study on the implementation of green skills among secondary school students. *International Journal of Academic Research in Business and Social Sciences*, 7(12), 327–345. <https://doi.org/10.6007/IJARBS.v7-i12.3615>
- Koh, L. P. (2007). Impending disaster or sliver of hope for Southeast Asian forests? The devil may lie in the details. *Biodiversity Conservation*, 16, 3935–3938. <https://doi.org/10.1007/s10531-007-9177-3>
- Kwauk, C. (2020). *Roadmaps to quality education in a time of climate change*. Brookings. <https://www.brookings.edu/research/roadblocks-to-quality-education-in-a-time-of-climate-change/>
- Lateh, H., & Muniandy, P. (2010). Environmental Education (EE): Current situational and the challenges among trainee teachers at teachers training institute in Malaysia. *Procedia – Social and Behavioral Sciences*, 2(2), 1896–1900. <https://doi.org/10.1016/j.sbspro.2010.03.1005>

- Lee, M. N. (2006). Centralized decentralization in Malaysian education. In C. Bjork (Ed.), *Educational decentralization: Education in the Asia-Pacific region: Issues, concerns and prospects* (Vol. 8, pp. 149–158). Springer. https://doi.org/10.1007/978-1-4020-4358-1_10
- Mahat, H., & Idrus, S. (2017). Education for sustainable development in Malaysia: A study of teacher and student awareness. *Geografia: Malaysian Journal of Society and Space*, 12(6), 77–88. <https://ejournal.ukm.my/gmjss/article/view/18022/5627>
- Mahat, H., Saleh, Y., Hashim, M., & Nayan, N. (2016). Model development on awareness of education for sustainable schools development in Malaysia. *Indonesian Journal of Geography*, 48(1), 37–46. <https://doi.org/10.22146/jig.12446>
- Ministry of Education Malaysia. (2013). *The Malaysia education blueprint*. https://www.moe.gov.my/images/dasar-kpm/articlefile_file_003108.pdf
- Ministry of Energy, Science, Technology, Environment, and Climate Change. (2018). *Malaysia's roadmap towards zero single-use plastics 2018–2030*. <https://www.mestec.gov.my/web/wp-content/uploads/2019/03/Malaysia-Roadmap-Towards-Zero-Single-Use-Plastics-2018-20302.pdf>
- Ministry of Environment and Water. (2018). *Sekolah Lestari Anugerah Alam Sekitar (SLAAS)*. <https://www.doe.gov.my/portalv1/wp-content/uploads/2013/01/Laman-Web-JAS-SLAAS-1.pdf>
- Mokshein, S. E. (2019). Education for Sustainable Development (ESD) in Malaysia: Policy, program and evaluation. In *Proceedings of the 3rd International Conference on Current Issues in Education (ICCIE 2018)*. Atlantis Press. <https://doi.org/10.2991/iccie-18.2019.2>
- Mumtazah, O., & Norhafidah, A. (2009). Bagaimanakah amalan penggunaan lestari remaja sekolah? *Jurnal Pengguna Malaysia*, 13, 30–45.
- Mustam, B., & Daniel, E. S. (2018). Informal and formal environmental education infusion: Actions of Malaysian teachers and parents among students in a polluted area. *MOJES: Malaysian Online Journal of Educational Sciences*, 4(1), 9–20. <https://mojes.um.edu.my/article/view/12641>
- Noordin, T. A., & Sulaiman, S. (2010). The status on the level of environmental awareness in the concept of sustainable development amongst secondary school students. *Procedia-Social and Behavioral Sciences*, 2(2), 1276–1280. <https://doi.org/10.1016/j.sbspro.2010.03.187>
- Othman, A. F., & Ariff, S. U. (2019, May 28). Yeo: Plastic dumped here to be shipped back today. *New Straits Times*. <https://www.nst.com.my/news/nation/2019/05/491970/yeo-plastic-dumped-here-be-shipped-back-today>
- Othman, M., & Yahaya, N. (Eds.). (2011). *Penggunaan lestari: Bagaimana Tingkahlaku remaja?* Penerbit Universiti Putra Malaysia.
- Rahman, H. A. (2009). Global climate change and its effects on human habitat and environment in Malaysia. *Malaysian Journal of Environmental Management*, 10(2), 17–32. <http://journalarticle.ukm.my/2286/>

- Razak, S. A. A., Kamarudin, M. K. A., Toriman, M. E., Wahab, N. A., Saad, M. H. M., & Bati, M. (2019). Relationship between knowledge and attitudes towards environmental education among secondary school students in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 9(12), 37–49. <https://doi.org/10.6007/IJARBSS.v9-i12.6664>
- Sachs, J. D. (n.d.). *Malaysia's structural economic change: past, present, and future*. <https://www.ehm.my/publications/articles/malaysias-structural-economic-change-past-present-and-future>
- Saravanan, S., Rosta, H., & Ahmad, M. (2013). Amalan penggunaan lestari dalam kalangan pelajar tingkatan empat di daerah Kluang Johor. In *Geography and environment in national development and transformation: Proceedings of the 4th National Conference on Geography and Environment* (pp. 169–180). Department of Geography and Environment, Sultan Idris University of Education, Tanjong Malim, Perak.
- Vijaindren, A. (2019, October 1). Time to turn household waste into cash, says Zuraida. *New Straits Times*. <https://www.nst.com.my/news/nation/2019/10/526153/time-turn-household-waste-cash-says-zuraida>