

ICLES 2018
International Conference on Law, Environment and Society

**ENVIRONMENTAL EDUCATION IN MALAYSIA: PAST,
PRESENT AND FUTURE**

Hanim Kamaruddin (a)*, Norasmah Othman (b), Sarmila Md Sum (c), Nur Zafirah
Abdul Rahim (d)
*Corresponding author

(a) National University of Malaysia (UKM), Faculty of Law, Selangor, Malaysia, hanim@ukm.edu.my

(b) National University of Malaysia (UKM), Faculty of Education, Selangor, Malaysia, lin@ukm.edu.my

(c) National University of Malaysia (UKM), Faculty of Social Science and Humanities, Selangor, Malaysia,
sarmila.mdsun@ukm.edu.my

(d) National University of Malaysia (UKM), Faculty of Education, Selangor, Malaysia,
nurzafirah.abdulrahim@gmail.com

Abstract

Lack of environmental education in schools to create awareness on the importance of protecting the environment and to address environmental pollution is often at the forefront in improving the national education framework. The current syllabus in Malaysia raises questions on whether problems of climate change and sustainable development are being addressed in existing environmental education to increase awareness or positive behavior towards environmental preservation in Malaysia. Hence, recognition towards ensuring that national education system is aligned to national development and environmental sustainability must be clearly expressed in the overall objective of national education framework. The methodology for this study includes secondary materials such as journal articles, printed policies and other relevant support materials. A close perusal of these materials found that there is no specific subject on environmental education in the Malaysian school syllabus, thus creating poor public awareness and low civic consciousness on environmental preservation and protection - coupled with lack of understanding and exposure on environmental issues, knowledge and updated information. Environmental education in Malaysia therefore must be reviewed to ensure that knowledge on environmental protection from every aspect including legislation and policies, should be embedded in the new education syllabus.

© 2019 Published by Future Academy www.FutureAcademy.org.UK

Keywords: Environment, education, sustainability, Malaysia, awareness.



1. Introduction

The main cause of the damage and destruction of nature is due to human demeanour that forgets the responsibility that *Allah* (the Creator) has entrusted to mankind, which is to preserve and benefit from His creation. Mankind's apathetic attitude has resulted in the consequences of neglecting their responsibility to preserve and conserve nature; consequently, causing natural disasters to plague mankind. Hence, education, particularly relating to the environment, is the most effective instrument to address this problem (Haliza, 2017, p. 62). The need for development of the rapidly increasing global population has resulted in pollution problems and the deterioration of the quality of the environment which became a hot topic both internationally and nationally (Hanifah & Shahrudin, 2016). To address the problem of development demand, conservation of the environment for sustainable development is a proactive and practical idea underpinning modern development (Huckle, 2009; Joshi, 2009; Moroye, 2005; Sterling, 2003; Scoullos & Malotidi, 2004). Rampaging development has badly affected the environment and threatens future generations affecting their survival (Aini & Laily, 2010). Doost, Sanusi, Fariddudin and Jegatesan (2011); Fielding and Head (2012); Foo (2013); Hanifah, Shahrudin, Mohamad, and Noraziah (2014) and Hazura, (2009) emphasize that sustainable development can be changed and improved through education (Habibah & Punitha, 2012; Liu, 2009). Seen in this light, teachers are the main drivers of education for sustainable development. A widespread and deep understanding of sustainable development issues can be achieved through education (Bernardina, 2000). The education process regarding the environment, through the environment and for the environment is the definition of environmental education (Adenan Satem, 2004). Malaysia is a developing and competitive nation in the economic and industrial sectors striving to provide a comfortable living standard for its citizens. One outcome of this is that the construction flow has hastened but the rapid development has affected future generations due environmental degradation as a result of unplanned constructions (Mohammad Affendy & Nazirah 2014).

During the Tbilisi, Georgia (USSR) conference in 1977, education was accepted as the basis for environmental protection and sustainable development and to address the environmental issues, the school will be a place of change (Moroye, 2005). Perikleous (2004) stated that to control the life and prosperity of future generations, awareness of environmental quality is very important and this starts with environmental education. Indirectly, ecosystems and human life have been negatively affected by the changes in world climate due to developments that ignore the implications of unsustainable development which have also despoiled the environment (Yendo et al., 2015). UNESCO (2002) is deeply concerned with environmental issues and the importance of environmental education as well as the role of educators to improve human capability in addressing environmental and development issues. The most influential agent with the highest potential to initiate change for the society is education (Haryati, 2011). The demand for forest resources, water and fossil resources has led to the depletion of these resources and the deterioration of environmental quality (Nik Fuad & Noraien, 2007; Katiman & Asmah 2006). As a result, the well-being of human life is increasingly threatened by the deterioration of resources and environmental quality (Hanifah, Shahrudin, Noraziah, & Mohamad, 2015).

Malaysia, like most countries in the world, is struggling with the challenge of balancing between population growth and increased demand with a continually declining natural environment (Economic Planning Unit, 2015). During the Eleventh Malaysia Plan (11MP) 2016-2020, green growth will be an

important shift in the socio-economic development of the country to protect development outcomes and biodiversity. The planning of socio-economic development strategies that can improve the sustainability of climate change and natural disasters is critical. An environment that supports green growth will be strengthened primarily in terms of fundamental and regulatory framework, the development of exemplary role models, green technology investment and financial instruments (Economic Planning Unit 2015, pp.6-2). Local Agenda 21 in 2001, under the auspices of the Ministry of Housing and Local Government is one of the examples of the priorities set for the sustainable development in Malaysia where the participation of school and community is part of the theory and practice of education for sustainable development (Hopkins, 2013; Gough, 2005).

In 1998, The Malaysian Ministry of Education did note that the goal of environmental education is to create a society that is sensitive and attentive towards environmental issues, acquire knowledge, skills, value and commitment to make an effort and act towards resolving environmental problems. The teachers' guidebook on environmental education, implemented across the primary and secondary curriculum and published by the Curriculum Development Centre of Malaysia's Ministry of Education was officially introduced in 1998. This book is a guideline for environmental education in Malaysia (Mohammad Zohir & Nordin, 2007). Moral Education, Geography, Language, Islamic Studies and Civic and Citizenship Education subjects are all subjects with the element of environmental education that is taught formally in school while informal education occurs through co-curricular activities such as Nature Club and 3K Project (safety, cleanliness and elegance), quiz competitions, Recycling Campaigns, talks and visits (Ministry of Education, New Zealand, 2004). Knowledge, understanding, environmental awareness and learning about the environment involving human interaction with the environment are all part of environmental education (Curriculum Development Centre, Ministry of Education, Malaysia, 1998) and have been applied in the national education curriculum since the 1980s (Rashidah, 2002). In general, environmental education at secondary school level is not taught as a single subject but is implemented through Geography, Moral Education, Life Skills and Science subjects (Muhd Ibrahim, Durairaj, & Marlizah, 2016, p. 29).

It should be noted that education methods may vary according to the particular country because of the diversity of local features such as climate, genetic flora and fauna and the physical condition of the land. Global warming has become worse over the past few decades and has been debated, discussed, surveyed around the world. The onset of environmental damage began with the era of the Industrial Revolution in 1750. At that time, climatic conditions were benign as the world population was considerably small. Venice, a city in Italy, which is flooded with sea water, is an example of natural damage while the fairly recent cyclone phenomenon in the states of Johor and Kedah is an example of environmental damage in Malaysia. Due to the overwhelming increase in temperature, carbon dioxide and other gases saturate the atmosphere. Greenhouse gases trap the earth's heat contributing to global warming. Vehicles are the largest contributors to global warming according to the book *Hot, Flat and Crowded* by Thomas L. Friedman (2011). According to Friedman, three causes influence the establishment of lifestyle which are (1) Heat refers to human activities, (2) Flat refers to the rapid development of technology and 3) Crowded reflecting an increase in population size. The increase in population will cause the current global warming problem to become increasingly complex due to the onslaught of technology and transportation.

Environmental problems have led many countries, including Malaysia, to become aware of the importance of environmental education in imbuing young people with the concept of through formal or informal education. However, environmental education should not only taught at the school level but also at home where parents or guardians play a significant role through leadership by example, for instance, not littering and saving water (Abdul Malek, 2016).

Returning to the construction industry, the failure in the planning process of sustainability is the cause of most construction projects failing to achieve sustainability goals (Choi, 2009) as according to Zhang, Shen, Love, & Treloar (2000) and Hinze & Gambatese (2003), the biggest contributor to environmental pollution is the construction industry. Waste disposal should be addressed by the project developer in order to resolve environmental issues to (Chen et al., 2002; Teo & Loosemore, 2001).

While environmental degradation has been discussed and debated for so long, no concrete action has been taken to address this problem (West, 2010) because the lack of public awareness of the importance of the environment is a result of rapid development which has led to the lackadaisical attitude of the public regarding the environment (Ahmad, 2009). Destruction of forests, pollution, greenhouse effect, ozone depletion, erosion and extinction of species are global problems due to the lack of application and awareness of environmental education. Malaysia is facing major problems of air pollution (the annual haze), water pollution, noise pollution, illegal waste disposal cases, land pollution, oil spill cases (Department of Environment, 2005; 2006; 2007). Environmental education is a step towards addressing environmental issues with the hope that through environmental education, people are more aware of the issues (Ballantyne, Connell & Fien, 2006).

Denmark has already implemented environmental education, but this is not the case in Malaysia where environmental education is not taught as a stand-alone subject (Larsen & Azizi, 2000). Therefore, environmental education cannot be reported like other subjects as there is no assessment and evaluation of the student's level of attainment (Mohd Yusop, Ahmad, & Ghazally, 2000). Despite the fact that environmental education has been integrated into several subjects and activities in the primary and secondary level in Malaysia, the objectives have yet to be fully achieved (Rohana, Rosta, Azizi, & Ismi 2013).

The awareness and interest of teachers towards environmental education is one of the factors that affects the awareness of environmental education (Hotinli, 2004). Teachers should not only use appropriate teaching and learning methods, but should also inculcate, nurture and preserve environmental education through school activities, whether in classroom or outside of classroom and this clearly shows that commitment as a teacher is pivotal (Mohammad Zohir & Nordin, 2007). Teachers and parents are important agents for the delivery of environmental education knowledge be it formally or informally (Abdullah, Haryati, & Seow, 2013). The chalk and talk method is a method commonly used by teachers in teaching and learning sessions, but this method fails to create interest among students and the delivery techniques are not effective because of the lack of real teaching and learning environment (Isaac, 2004). This is supported by Sanatora (2003) and Abdul Malek (2016). Students are not given the opportunity to express their opinions and solve the problems during teaching and learning session because teachers are overdependent on notes and rote learning techniques.

Hence, this study has an impact on the education system in Malaysia and it involves teaching staff as well as parents and school students. This is because, education is the basis of change in a country. In addition, environmental education impacts the nation on future generations. If environmental education is not taken seriously it will affect the future and this will affect the survival and sustainability of life

1.1. Theoretical / Conceptual Framework

The conceptual framework for this study was developed to study environmental education in Malaysia in terms of its past, present and future. The theory used in this study is the attitude forming theory used to raise the awareness of society towards environmental education in Malaysia. According to Kelman and Saifuddin (2010), one's attitude change can be changed through three processes, namely the willingness of an individual to accept the imminent change. Next, is identification in which the individual will imitate or follow other individuals or groups? The final process is internalization where the individual is willing to accept or internalise the influence. Through these three processes, the awareness of environmental education can be enhanced through one's attitude. This is because consciousness is not realized if an individual is unwilling to change his attitude.

2. Problem Statement

It is clear that environmental education at the school level is vital if Malaysia wants to embrace sustainable development goals and resolve the current environmental degradation that shows no signs of stopping. This raises questions on whether problems of climate change and sustainable development are being addressed in existing environmental education to increase awareness or positive behavior towards environmental preservation in Malaysia. Ensuring that national education system is aligned to national development and environmental sustainability must be clearly expressed in the overall objective of national education framework.

3. Research Questions

To what extent does the current Malaysian school curriculum address environmental education?

4. Purpose of the Study

Environmental education at the early stage is crucial and will have a major impact on the future of an individual. Nevertheless, in line with the national aspiration of becoming a developed country, development must be aligned to sustainable development goals for the preservation of human life in future. Environmental problems can be mitigated through environmental education either formally or informally. The family and school plays a pivotal role in creating awareness of the importance of sustaining and preserving the environment. The purpose of this study is to identify the extent to which environmental education is being taught in the current school curriculum in Malaysia

5. Research Methods

This study used the qualitative approach to explore a situation. An exploratory study is useful when dealing with flexibility of data sources and uncovering new knowledge which aligns with this research on education environmental in Malaysia. Data was collected from google search engines with a focus on education in Malaysia, educational policies, Malaysian Education Development Plans and textbooks that have elements of environmental education.

6. Findings

Analysis of the current literature found there is poor public awareness and low civic consciousness on environmental preservation and protection due to a poor understanding of and education on environmental issues. There is no specific subject on environmental education in any school syllabus even though Rohana Rosta, Azizi and Ismi (2013) found that exposure to environmental education activities whether in the classroom or outside of the classroom affects the level of knowledge and awareness of students towards the environment. The need for environmental education for environmental sustainability has been postulated by Aini, Nurizan and Fakhrol-Razi (2007) that formal or informal environmental education can raise awareness among the community and the students. However, with the absence of the said syllabus, an empirical investigation by Mumtazah and Norhafidah (2009) that found students' awareness of environmental sustainability was moderate where students only practiced water and electricity savings but rarely separated boxes or tin scraps according to the provided recycling bins. This has led to further enquiry on how environmental awareness can be enhanced among students. Abdullah et al. (2013) found that the awareness of environmental education can be achieved through the cooperation of the school, parents and the community.

Although there is no specific syllabus on environmental awareness, environmental education still takes place in school where according to Abdullah (2000), environmental education is covered across all school subjects. It is believed to be integrated in the syllabus of other subjects taught to the students in Malaysia. It may be extrapolated that because of this, Abidah (2010) found that students' attitudes to recycling according to Islamic teaching were positive. This clearly shows that respondents are aware of the need to look after the environment. In terms of teacher behaviours, Masitah et al. (2013) found that teachers' perceptions towards principal's instructional leadership practices in the dimensions of teaching program management and environmental programs influence the self-efficacy of teachers towards the implementation of natural education in school. Boyes and Stanisstreet (2012) found that trainee teachers faced a moderate level of problems related to environmental education.

7. Conclusion

Teachers need to be open-minded and always ready to improve their professionalism through lectures, workshops, seminars or courses related to environmental education as well as enhance their ability and wise in managing personal interests and commitment (Mohammad Zohir & Nordin, 2007). Overall, awareness of environmental education can be enhanced through schools and teachers as this is the dominant medium to the dissemination of environmental knowledge to students. In addition, teachers should adopt a

sustainable lifestyle at school and the attitude of teachers should be positive when discussing the environment as teachers are role models for their students. The application of environmental awareness can be absorbed in all subjects according to the suitability of the school's sustainable program (Hanifah et al., 2015). When the application of positive environmental values is not fully implemented by the teachers and the school, the students would be affected (Mohmadisa & Mohamad Suhaily, 2005). However, cooperation from other stakeholders such as parents, communities and non-statutory bodies is also needed to ensure that the goals and objectives of environmental education across the curriculum are attainable (Abdullah et al., 2013). In addition, the community paradigm should also change so that environmental pollution problems can be overcome (Mohammad Affendy & Nazirah 2014).

In view of all this, the government should actively introduce environmental education in schools in order to inculcate and enhance the love for the environment as well as to raise awareness of environmental issues to future generations (Haliza, 2017).

Acknowledgments

The authors would like to acknowledge the Faculty of Education, UKM and the community of Kampung Sungai Tekai in Pahang for their assistance in this research. Similarly, thanks is also due to the Wildlife and National Parks Department for its valuable feedback and Tenaga Nasional Berhad Research for providing support and funding for project research GG-2018-006.

References

- Abdul Malek (2016). *Towards Preserving the Environment for Future Generations*, Pulau Pinang: Universiti Sains Malaysia
- Abdullah, A. S. (2000). *Syllabus for high school integrated curriculum: Geography*, Kuala Lumpur: Ministry of Education.
- Abdullah, N. H. L., Haryati, S., & Seow, T. W. (2013). Environmental education is a key medium in context of raising environmental awareness: a perceptual study the views of administrators, teachers, parents and students. *6th International Seminar Proceedings, Ecology, Human Habitat and Environmental Changes in the Malay World*, 295-306.
- Abidah, R. O. (2010). *University of Technology students' perceptions of recycling programs from an Islamic perspective*. Unpublished bachelor's thesis, Universiti Teknologi Malaysia.
- Adenan Satem (2004). *Foundations of sustainable school*. Kuala Lumpur: Dewan Bahasa dan Pustaka
- Ahmad, M. Z. (2009). *Environmental education in school: Teacher commitment*. Retrieved from <http://www.scribd.com/doc/16999396/Pendidikan-Alam-Sekitar-Di-Sekolah>
- Aini, M. S., & Laily, P. (2010). Preparedness of Malaysian pre-school educators for environmental education. *Pertanika Journal of Social Sciences & Humanities*, 18(2), 271-283.
- Aini, M. S., Nurizan, Y., & Fakhru-Razi, A. (2007). Environmental comprehension and practices of Malaysian youth. *Journal of Environmental Education Research*, 13(1), 17-31.
- Ballantyne, R., Connell, S., & Fien, J. (2006). Students as catalysts of environmental change: a framework for researching intergenerational influence through environmental education. *Environmental Education Research*, 12(3-4), 413-427.
- Bernardina, C. S. (2000). Exploring education for sustainable development: Theory and practice ILS in Philippine higher education institutions. Unpublished doctoral Dissertation *University of Alberta*.

- Boyes, E., & Stanisstreet, M. (2012). Environmental education for behaviour change: which actions should be targeted? *International Journal of Science Education*, 34(10), 1591-1614.
- Chen, Z., Li, H., & Wong, T. C. C. (2002). An application of bar-code system for reducing construction wastes. *Automation in Construction*, 11(5), 521-533.
- Choi, C. (2009). Removing market barriers to green development: Principles and action projects to promote widespread adoption of green development practices. *JOSRE*, 1(1), 107-138.
- Curriculum Development Centre (1998). *Handbook for environmental education teachers across the KBSM curriculum*. Ministry of Education, Malaysia.
- Department of Environment. (2005). *Environmental Requirements*. Ministry of Natural Resources and Environment.
- Department of Environment. (2006). *Environmental Requirements: A Guide for Investors*. Ministry of Natural Resources and Environment.
- Department of Environment. (2007). *Environmental Requirements: A Guide for Investors*. Ministry of Natural Resources and Environment.
- Doost, H. K., Sanusi, Z., Fariddudin, F., & Jegatesan, G. (2011). Institutions of higher education and partnership in education for sustainable development: Case study of the regional centre of expertise (RCE) Penang, Malaysia. *Journal of Sustainable Development*, 4(3), 108-117.
- Economic Planning Unit. (2015). *Rancangan Malaysia Kesebelas 2016-2020* [11th Malaysia Plan]. Kuala Lumpur: Malaysian Printers Limited.
- Fielding, K. S., & Head, B. W. (2012). Determinants of young Australians' environmental actions: The role of responsibility attributions, locus of control, knowledge and attitudes. *Environmental Education Research*, 18(2), 171-186.
- Foo, K. Y. (2013). A vision on the role of environmental higher education contributing to the sustainable development in Malaysia. *Journal of Cleaner Production*, 61, 6-12.
- Friedman, T. L. (2011). *Hot, Flat, and Crowded 2.0: Why We Need a Green Revolution--and How It Can Renew America*. Picador: New York
- Gough, A. (2005). Education for sustainable development: Challenges for schools, curriculum and instruction. *JPPG Education Conference*, 28-30 August, Shangri-La Hotel, Penang.
- Habibah, L., & Punitha, M. (2012). *Environmental education teaching practice at the Institute of Teacher Education, Penang Campus*. *Geography-Malaysian Journal of Society and Space*, 8(2), 1-6.
- Haliza, A. R. (2017). Efforts and challenges in the application of environmental education in Malaysian school system. *Asian Journal of Environment, History and Heritage*, 1(2), 61-70.
- Hanifah, M., & Shahrudin, H. (2016). Education for sustainable development in Malaysia: A study of teacher and student awareness. *Malaysian Journal of Society and Space*, 12(6), 77-88.
- Hanifah, M., Shaharuddin, A., Noraziah, A., & Mohamad, S. Y. C. N. (2015). Level of practice of sustainable use among teachers in Puchong, Selangor. *Sains Humanika*, 5(1), 19-26.
- Hanifah, M., Shaharuddin, A., Mohamad, S. Y. C. N., & Noraziah, A. (2014). Sustainable development education – The relationship between parents and students. *Geografia-Malaysian Journal of Society and Space*, 10(5), 71-84.
- Haryati, S. (2011). *The issues of urban quality of life*. Parit Raja: UTHM.
- Hazura, A. B. (2009). *Relationship between appreciation of religion, value of life and knowledge environment and Muslim students' attitudes and behaviour*. Unpublished doctoral thesis, School of Educational Studies, Universiti Sains Malaysia.
- Hinze, J., & Gambatese, J. (2003). Factors that influence safety performance of specialty contractors. *Journal of Construction Engineering and Management*, 129(12), 159-164.
- Hopkins, C. (2013). Educating for Sustainability; An Emerging Purpose of Education. *Kappa Delta Pi Record*, 49, 122–125.
- Hotinli, G. (2004). Environmental education in Turkey. *Sustainable Mediterranean*, 34, 8-10
- Huckle, J. (2009). Sustainable schools: Responding to new challenges and opportunities. *Geography*, 94(1), 13-21.
- Isaac, N. J. B. (2004). The species problem and testing macro evolutionary hypotheses. *Diversity and Distribution*, 10, 275-281.

- Joshi, U. (2009). Education for sustainable development: The role of the university. *International Forum of Teaching and Studies, Marieeta*, 62-69.
- Katiman, R., & Asmah, A. (2006). *Assessment and management of natural resources*. Bangi: Universiti Kebangsaan Malaysia.
- Kelman, C. H., & Saifuddin, M. (2010). Compliance, Identification and internalization three process of attitude change. *Conflict Resolution*, 2(1), 53-60.
- Larsen, E., & Azizi, M. (2000). *Strengthening of environmental education in primary and secondary schools in Malaysia: Study Report*. Kuala Lumpur: Ministry of Education, Malaysia.
- Liu, J. (2009). Education for sustainable development in teacher education: Issues in the case of York University in Canada. *Asian Social Science*, 5(5), 46-49.
- Masitah, M. Y., Azizi, M., Ahamad Makmom, A., Bahaman, A. S., Ramli, B., & Noriati, A. R. (2013). Faktor- faktor yang mempengaruhi efikasi sendiri guru sekolah menengah di Malaysia dalam pelaksanaan pendidikan alam sekitar. *Asia Pacific Journal of Educators and Education*, 28, 131–153.
- Ministry of Education, New Zealand. (2004). Environmental education in New Zealand schools: research into current practice and future possibilities. *A review of national and international research literature on environmental education practices*, 2.
- Mohammad Affendy, O., & Nazirah, Z. A. (2014). Concepts and practices of awareness of environmental issues at the beginning of the construction project through the value management phase. *Social Sciences Postgraduate International Seminar (SSPIS)*. Universiti Sains Malaysia, November 26. 173-194.
- Mohammad Zohir, A., & Nordin, A. B. (2007). Environmental education in schools: Teacher commitment, *Pendidikan Lestari*, 7(2), 74-81.
- Mohd Yusop S. H., Ahmad, E., & Ghazally, S. (2000). *Kajian mengenai pengetahuan, amalan dan sikap terhadap alam sekitar di kalangan pelajar-pelajar sekolah menengah*. Unpublished research report, Institut Teknologi Tun Hussien Onn, Johor.
- Mohmadisa, H., & Mohamad, S. Y. C. N. (2005). *Development and environment in Malaysia*. Tanjong Malim: Sultan Idris Education University.
- Moroye, C. (2005). Common ground: An ecological perspective on teaching and learning. *Curriculum and teaching dialogue*, 7(1/2), 123-139.
- Muhd Ibrahim, M. D., Durairaj, E., & Marlizah, Y. (2016). Awareness level and environmental education practice among form 4 science stream students in Hulu Selangor District. *Geografi*, 4(2), 28-35.
- Mumtazah, O., & Norhafidah, A. (2009). What is the practice of the sustainable use of school teens? *Jurnal Pengguna Malaysia*, 13(Dis.), 30–45.
- Nik Fuad, M. K., & Noraien, M. (2007). *Eating life*. Kuala Terengganu: Universiti Malaysia Terengganu.
- Perikleous, E. (2004). The status of environmental education in Cyprus today. In. *MIO-ECSDE. The status of environmental education in the Mediterranean countries within the formal & non- formal educational systems. Dec*, 34.
- Rashidah, B. G. (2002). *Effectiveness of the 1st level natural hero project on knowledge among students in Selangor on pollution and environmental protection*. Unpublished bachelor's thesis, Universiti Malaya, Kuala Lumpur.
- Rohana, O., Rosta, H., Azizi, M., & Ismi, A. I. (2013). The effect of teaching and learning of environmental education through mural painting activity in enhancing the knowledge and awareness of secondary school students towards the environment. *Asia Pacific Journal of Educators and Education*, 28, 11-31.
- Sanatora, S. (2003). *Group (cooperative) learning style on student performance of public certificate construction semester 4 in road engineering education (C306)*. Unpublished master's thesis, Kolej Universiti Teknologi Tun Hussein Onn, Johor Bahru, Malaysia.
- Scoullou, M., & Malotidi, V. (2004). Handbook on methods used in environmental education and education. Athens: MIO-ECSDE. Retrieved from http://www.medies.net/_uploaded_files/publications/HANDBOOK._ENGpdf.pdf
- Sterling, S. (2003). Whole systems thinking as a basis for paradigm change in education: Explorations in the context of sustainability. Doctoral dissertation, University of Bath: UK.

- Teo, M. M. M., & Loosemore, M. (2001). A theory of waste behaviour in the construction industry, *Journal of Construction Management and Economics*, 19(7), 741-751.
- UNESCO (2002). *Education for Sustainable Development*. Retrieved from <http://www.unesco.org/en/esd/>
- West, L. (2010). *What can you do to protect and preserve the environment?* Retrieved from http://environment.about.com/od/greenlivingdesign/u/what_to_do.htm
- Yendo, A. E., Muhammad, D., Ahmad, P. M. S., Mahmud, M. J., & Basri, I. (2015). An assessment of green mosque index in Peninsular Malaysia. *American-Eurasiaon J. Agric. & Environ. Sci*, 15, 114-122.
- Zhang, Z. H., Shen, L. Y., Love, P., & Treloar, G. (2000). A framework for implementing ISO 1400 in construction. *International Journal of Environmental Management and Health*, 11(2), 145-148.