Malaysian Journal of Social Sciences and Humanities (MJSSH) (e-ISSN : 2504-8562)
2022, Volume 7, Issue 11, e001874
DOI: https://doi.org/10.47405/mjssh.v7i11.1874

Systematic Literature Review: Students' Sustainable Thinking Toward Environment

Noor Asiah Ab Manaf[1*], Rabiatul-Adawiah Ahmad Rashid[2]

[1]School of Educational Studies, Universiti Sains Malaysia (USM), 11800 Pulau Pinang, Malaysia.
Email: noor_asiah88@student.usm.my
[2]School of Educational Studies, Universiti Sains Malaysia (USM), 11800 Pulau Pinang, Malaysia.
Email: r_adawiah@usm.my

CORRESPONDING AUTHOR (*):
Noor Asiah Ab Manaf
(noor_asiah88@student.usm.my)

KEYWORDS:
Moral Education
Environmental Education
Sustainable Thinking

CITATION:
Noor Asiah Ab Manaf & Rabiatul-Adawiah Ahmad Rashid (2022). Systematic Literature Review: Students' Sustainable Thinking Toward Environment. *Malaysian Journal of Social Sciences and Humanities (MJSSH), 7*(8), e001876. https://doi.org/10.47405/mjssh.v7i11.1874

ABSTRACT

Environmental issues are often debated in the mass media, thus indicating the need for improvement in existing efforts, primarily through the education system. It is common knowledge that environmental education is a curriculum integrated into several subjects, one of which is Moral Education. In addition, environmental sustainability is one of the elements across the curriculum applied in the Moral Education. This shows that the application of this education is crucial in helping to realize the goals of the Moral Education curriculum in line with the goals of sustainable development. Therefore, this article is presented to review the literature on students' sustainable thinking toward the environment. The researchers use the Systematic Literature Review methodology based on three stages of selecting relevant articles: identification, screening, and eligibility. The findings of this article showed that the level of sustainable thinking of students is still at a low level, while the application of environmental education is not satisfactory. This research integrated various research designs where studies were selected based on published standards. The articles used were those published from 2015 to 2022. This study selected articles using two leading databases, Scopus and Web of Science, and one supporting database, Google Scholar. This study is expected to be a source for other studies on sustainable thinking toward the environment.

Contribution/Originality: This study contributes to the existing literature on students' sustainable thinking towards the environment.

1. Introduction

Environmental education is among the important education for achieving sustainable development (Biplap & Rajidulhoque, 2015; Karpan et al., 2020; Shutaleva et al., 2020). The Ministry of Education Malaysia has taken steps to integrate environmental education into the curriculum in schools; one of them is through the Moral Education curriculum (Haliza, 2017). The term environmental education was pioneered by Thomas

© 2022 by the authors. Published by Secholian Publication. This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).

Pritchard in 1958 during the conference of the International Union for Conservation of Nature, IUCN, in Paris (Haliza, 2020). The Tbilisi Conference was the world's first Environmental Education conference organized in 1977, which was hosted by the United Nations Education, Scientific and Cultural Organization (UNESCO) and was attended by governments from around the world. During the conference, goals and objectives were formed as well as guidelines for implementing environmental education in the school curriculum (Haliza, 2020). Following the conference, UNESCO organized the Environmental Training Seminar held in Malta in 1991. As a result, the main goal of environmental education was decided, which is to help the global community to be more sensitive to environmental issues as well as improve their ability to maintain environmental sustainability (Haliza, 2020).

Based on Boca and Saraçli (2019), environmental education should be implemented in the curriculum so that students can proactively yield a sense of love for the nature of God's creation. This opinion is in line with Karpan et al. (2020) stating that the application of environmental education is the most effective and comprehensive strategy for solving problems involving the environment. The Moral Education curriculum emphasizes elements across the curriculum through environmental education to produce skilled human capital to face the challenges ahead. The primary purpose of this education is to educate the behaviors and mentalities of students so that environmental sustainability can be achieved (Begum et al., 2021; Boca & Saraçli, 2019). As a result, students will be more concerned about the environment and will always keep the message in mind for the sake of future generations (Edsand & Broich, 2020). This demonstrates that this education not only seeks to provide environmental knowledge but can also increase the tendency to engage in environmental conservation (Arslan, 2012; Dada et al., 2017; Velempini, 2017). Therefore, various efforts need to be intensified in preserving the environment for the sake of universal well-being.

It is well known that environmental destruction is an issue that occurs around the world from the behavior of some people who are too eager in the pursuit of development until destroying the harmony of the environment (Haliza, 2020). Therefore, various steps need to be taken to create environmental sustainability in line with the goals of sustainable development (Yi-Chen & Li-Hsun, 2020). One of them is environmental education. According to a study at a university in the United States, this curriculum is very important to be applied in the course of study for enabling graduates to relate environmental knowledge to their lives (Murzi et al., 2019). Moreover, this education can contribute to the formation of green behaviors in students (Isabel et al., 2018). At the school level, this education is a necessity to guide students in adopting a good attitude towards the environment (Kaur, 2019). This is evidenced through the integration of this education into the Moral Education curriculum, which seeks to produce thinkers capable of dealing with complex problems and making decisions ethically (Kementerian Pendidikan Malaysia, 2019). In Malaysia, issues involving the environment are often exposed in the mass media (Nur Syuhada et al., 2019; Nurul Hafizah & Abdul Aziz, 2016). This shows the attitude of a few people who are still insensitive to the environment and are always selfish (Muhd Ibrahim et al., 2016). Therefore, environmental knowledge should be taught early in school as a basis for establishing good attitudes and behaviors towards the environment (Haliza, 2020).

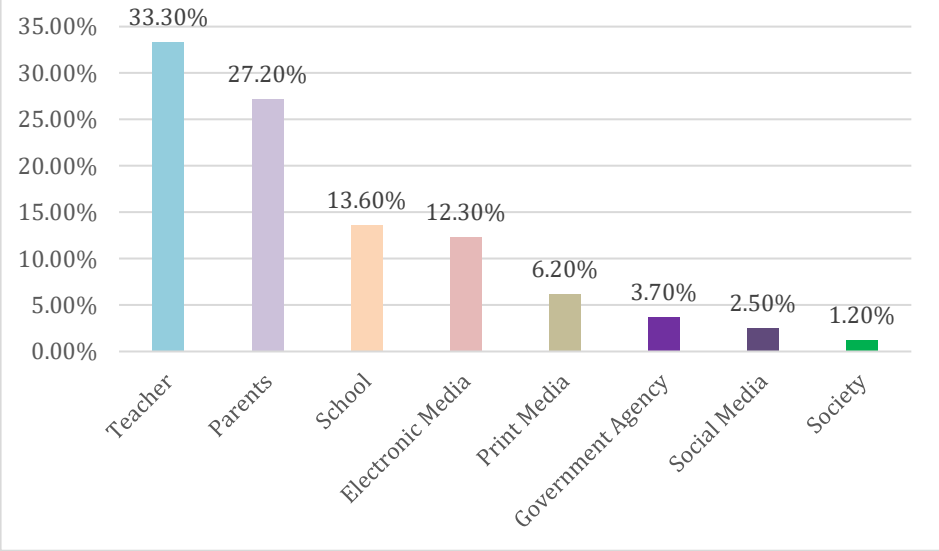
Apart from that, the Ministry of Environment and Water also supports the application of the environment in the education system. The ministry has always adhered to the mission of ensuring the sustainability of the environment and water preservation in line with international standards and practices (Haliza, 2017). School is a very important channel for educating students on how to nurture and cultivate the practice of loving

© 2022 by the authors. Published by Secholian Publication. This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).

and appreciating the environment (Norpishah et al., 2017). However, the level of knowledge and practice of students on environmental issues and problems is still at a moderate level (Dhanya and Pankajam, 2017; Muhd Ibrahim et al., 2016), owing to their attitude of being less sensitive toward the environment, which eventually restricts them from doing good deeds (Vasanthan & Nadarajan Thambu, 2018). The empowerment of the environmental education curriculum, especially in the Moral Education curriculum, needs to be constantly improved and refined more carefully to ensure students' awareness of environmental issues. Hence, teachers need to encourage students to enrich their environmental values to change their level of sustainable thinking for the better (Liu & Guo, 2018).

According to the findings of Nurul Hidayah et al. (2013), teachers play an important role in passing on knowledge about environmental education to students. This acknowledgment proves the great responsibility held by educators as they do not only act as a means of passing on knowledge but also as navigators for students with good morals (Vishalache Balakrishnansulam, 2021). This clearly shows the importance of this education in the curriculum, especially in developing the sustainable thinking of students while interacting with nature (Begum et al., 2021). The Global Action Program (GAP) is the most important pillar for UNESCO to support the 2030 sustainable development agenda based on two goals, namely to ensure that students always think about environmental sustainability and to enhance education and learning in all other SDGs including the environment (Yi-Chen & Li-Hsun, 2020). Accordingly, teachers need to plan and implement lessons that suit the needs and abilities of students to develop students' existing potential into the new potential that is more prominent. Figure 1 illustrates the findings of Nurul Hidayah et al. (2013) on students' perceptions of those who provide environmental knowledge.

Figure 1: Parties that provide environmental knowledge



Resource: Nurul Hidayah et al. (2013)

By delivering environmental knowledge more comprehensively, students can develop and improve their way of thinking. Furthermore, students with good thinking skills will not only be more guided in making decisions without neglecting environmental sustainability but can also strengthen themselves towards identifying their goals in the thinking process (Mardiyah, 2021). In the belief of the 4.0 revolution, various initiatives

© 2022 by the authors. Published by Secholian Publication. This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).

need to be taken to improve the sustainable behavior of students. This is because mastery of good knowledge is not enough to describe sustainable thinking. Therefore, various ways need to be highlighted to cultivate a more comprehensive way of thinking without neglecting the environment. Among them is through strengthening the environmental education system in schools, one of which is the Moral Education curriculum. The aspect of sustainable thinking is an attraction for researchers in ensuring environmental sustainability as outlined in the curriculum of Moral Education.

This research is guided by these questions: To what extent is the students' level of sustainable thinking towards the environment? Does environmental education affect students' levels of sustainable thinking? This research aims to bridge these gaps through an in-depth review of past related research more comprehensively to obtain input and a clear understanding of the level of sustainable thinking of students towards the environment through the application of environmental education. This research provides a significant contribution to the Ministry of Education Malaysia in formulating and designing the best curriculum to produce a generation that can sustainably and steadily develop the country. This research also helps educators to produce a more effective lesson plan to ensure that the real objectives of environmental education are achieved. This is in line with the National Education Philosophy, which is the basis for producing quality human capital. This philosophy is not just expressed in words but needs to be introduced into the educational process (Sidek, 2019). Moreover, this research is very useful for future researchers to understand more deeply and integrate this education into their research. As a result, information regarding sustainable thinking toward the environment can be expanded and the information gap can be filled.

2. Methodology

This research used the Systematic Literature Review (SLR) method. Many researchers often use this method, including Hayrol Azril et al. (2021b) and Ardoin et al. (2018). The justification for selecting this method is based on the assumption that the process of information retrieval and data analysis is becoming more systematic and structured (Higgins et al., 2011). Furthermore, the processed data can be repeated as the selected articles have been processed through several stages, including data extraction and data analysis (Hayrol Azril et al., 2021a). Articles in this study were selected using two leading databases, namely Scopus and Web of Science, and a supporting database, Google Scholar, in addition to the web database of public universities throughout Malaysia. The choice of these databases is in line with the proposal of Xiao and Watson (2019) to use more than one database as there is no complete database. This suggestion was further strengthened when Younger (2010) argued that the use of more than one database not only helps researchers produce more comprehensive data but can also bridge the gap between the data.

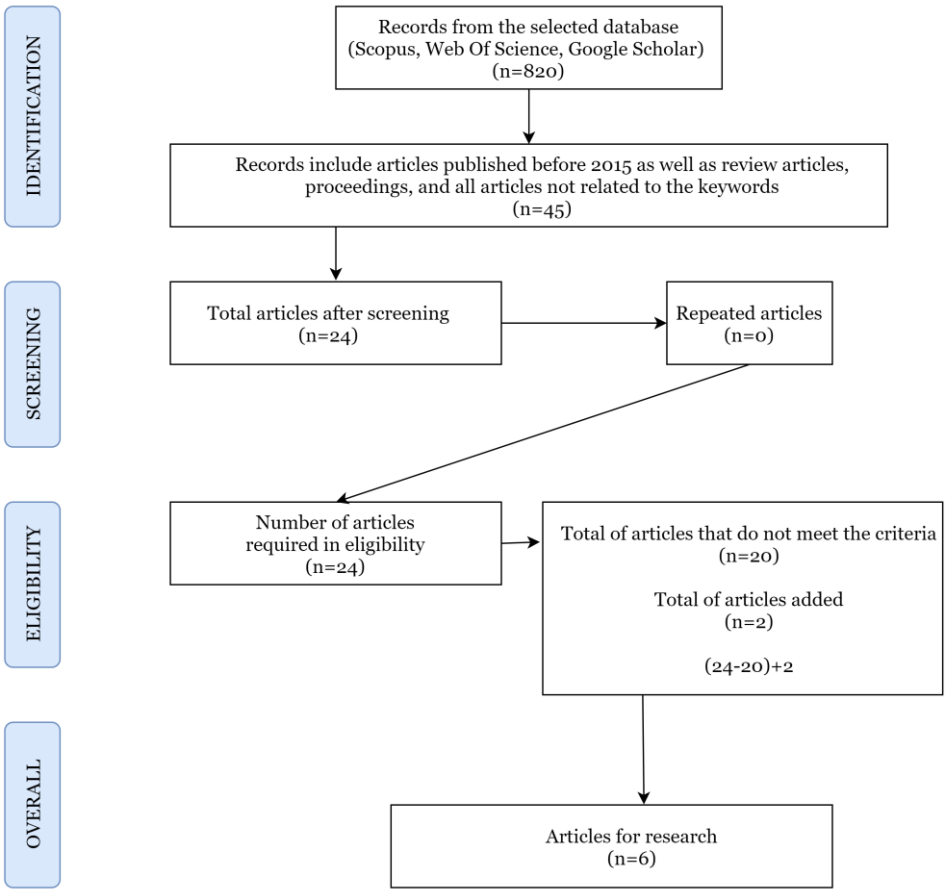
In this research, 3 phases of research were applied, which are identification, screening, and eligibility. Each of these phases went through a more thorough research process to obtain the best article. The identification phase is the phase of obtaining appropriate articles for the research, which focused on students' sustainable thinking towards the environment. Therefore, various databases were used in the process of obtaining these articles, such as Scopus, Web of Science, Google Scholar, and Google Search Engine, yielding 820 articles search results. Nonetheless, to make it easier for researchers to identify the best articles, various keywords were placed; for instance, in the Google search engine: Title-Abs- (environment education or moral education or sustainable

© 2022 by the authors. Published by Secholian Publication. This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).

thinking or *pendidikan alam sekitar* or *pendidikan moral* or *pemikiran lestari* or *alam sekitar*), whereas the terms "environmental education" or "moral education" and "sustainable thinking" were used while searching on Google Scholar.

After completing the first phase, the screening was conducted in the second phase. This phase was focused and concentrated on several listed criteria sets, among which is that only journal articles from 2017 to 2021 were used and coincided with the keywords employed. The keywords are "environmental education", "sustainable thinking", and "moral education". A total of 24 relevant articles were found after phase two was conducted. In the third phase, which is the eligibility phase, the selection of articles was done manually. The article selection process was carried out based on the relevance of the research title. In this phase, a total of 24 articles were evaluated for eligibility according to the set research criteria. It was later discovered that 20 articles did not fit with the research as they were over 10 years old, while 2 articles were added owing to their suitability for the research. After this phase was conducted, only six research articles needed to be reviewed. Figure 2 presents the process carried out and the number of articles included in this research.

Figure 2: SLR of Sustainable Thinking



Sumber: Hayrol Azril et al. (2021b)

To analyze this research systematically, six (6) articles were identified in line with the theme of the research on sustainable thinking toward the environment. The Table 1 shows 6 articles that were analyzed using Systematic Literature Review (SLR).

© 2022 by the authors. Published by Secholian Publication. This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).

Table 1: SLR of Sustainable Thinking

No	Research	Journal	Background	Issue/Gap	Method	Research Findings
1.	Repanovici et al. (2021)	Journal Sustainability MDPI	Development of Sustainable Thinking by Information Literacy	Lack of understanding of environmental education, which eventually creates an imbalance between knowledge and practice of the environment	Mixed method	The application of information literacy in environmental education can promote sustainable thinking to achieve sustainable development
2.	Zuhaira and Zul'azmi (2020)	E-Journal of Islamic Thought and Understanding	Development of Sustainable Mentality of Malaysian Society	Some individuals do not have a sustainable mindset toward the environment	Qualitative research (Document analysis)	The findings of the research indicate a need for improvement in the syllabus and delivery methods of environmental education to provide a significant impact in developing a sustainable mentality
3.	Fethiye Ozis et al. (2020)	American Society for Engineering Education	Mixed Method Approach to Evaluate Sustainability Thinking among the Next Generation of Civil and Environmental Engineers	Lack of practice in environmental sustainability	Mixed Method	Environmental course students have better sustainable values and thinking compared to civil engineering students. This shows the importance of applying environmental education
4.	Uddin et al. (2020)	Journal of Physics	Assessing secondary level students' critical thinking skills: Inspiring environmental education for achieving sustainable development goals	Lack of research on thinking skills in environmental education	Quantitative research (Questionnaire)	The level of thinking of high school students about the environment is still at a low level. There needs to be an emphasis on the teaching aspect of the environment
5.	Palmberg et al. (2017)	Education Science	Systems Thinking for Understanding Sustainability? Nordic Student Teachers' Views on the Relationship between Species Identification, Biodiversity, and Sustainable Development	Aspects of environmental sustainability are given less emphasis even though life and education are provided based on global knowledge	Quantitative research (Questionnaire)	The level of students' thinking about the environment is still at a low level. Environmental education needs to be implemented starting at the beginning of the school

© 2022 by the authors. Published by Secholian Publication. This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).

6.	Nazmi Durkan (2017)	Educational Research and Reviews	Examining the behavior and thinking levels of secondary school students (6th - 8th GRADES) towards the environment according to gender	Lack of awareness of the importance of environmental care	Quantitative research (Questionnaire)	There is a significant difference in the level of environmental thinking of high school students between male and female students. The level of environmental thinking of male students is higher than that of females

Based on Table 1, the results of the analysis collected six articles that correspond to the themes researched. This research clearly shows the importance of applying environmental education to increase the level of sustainable thinking toward the environment. Nevertheless, the findings indicated that the level of sustainable thinking in society, especially among students, is still at an unsatisfactory level. All of these articles focused on the importance of environmental education in generating sustainable thinking processes. It is common knowledge that Environmental Education is very important to help students increase their level of sustainable thinking in protecting the environment (Fragkoulis & Koutsoukos, 2018). Therefore, the introduction and implementation at the school level need to be given more attention (Haliza, 2017).

Based on research conducted by Uddin et al. (2020) on secondary school students, their level of thinking about the environment is still at a low level, suggesting that the application of environmental education needs to be made more comprehensive so that students can not only make good decisions but also change themselves to be more sensitive to issues involving the environment. This education needs to be constantly improved according to the issues often debated in the mass media as well as in printed media. As a result, students will love and appreciate the environment more as emphasized in the school curriculum, especially the Moral Education curriculum. In addition, sustainable thinking can be improved if all parties work together to practice a culture of loving the environment to enhance environmental sustainability.

Furthermore, according to Repanovici et al. (2021), enabling one to think sustainably requires several aspects, such as following the environmental education curriculum, improving environmental care skills, and finding more efficient sources of reference about the environment. These aspects can indirectly enhance students' sustainable thinking to a more optimal level. Past researchers have also explained that a person's thinking depends on the level of awareness and concern in their daily behavior (Gericke et al., 2019; Olsson, 2018; Olsson et al., 2016). This proves that to gain good thinking, students need to constantly improve their knowledge and always mobilize energy to proactively engage in activities involving the environment. As a result, students are not only able to enhance their sustainable thinking but also able to improve their knowledge at the global level.

Zuhaira and Zul'azmi (2020) stated that the biggest challenge in creating environmental sustainability is the difficulty of changing the mentality or way of thinking of some individuals. Hence, drastic improvements need to be constantly intensified in the education curriculum in schools, especially in line with the era of the Fourth Industrial Revolution (4IR). Through this empowerment, sustainable thinking patterns will be enhanced as a result of clearer and more realistic delivery. As a result, the mentality of the students will change for the better, thus avoiding them from occasionally neglecting

© 2022 by the authors. Published by Secholian Publication. This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).

the environment as they will realize that nature is a gift of God that needs to be maintained and protected. This demonstrates the importance of sustainable thinking in achieving the goals of sustainable development as outlined in the environmental education curriculum.

3. Suggestion

Several recommendations are outlined in this study for future scholarly consideration. First, more research needs to be carried out on environmental education, particularly Moral Education so that the process of knowledge delivery in the education system can be constantly updated without burdening all parties, especially students. As is well known, after *Kurikulum Standard Sekolah Menengah* (KSSM) was established, no specific values were used in the Moral Education curriculum related to the environment, such as Environmental Sustainability, Appreciating and Loving the Environment, Forecasting Environmental Issues, and Harmony between Humans and the Environment. Starting from 2016, the values applied in the *Kurikulum Standard Sekolah Menengah* (KSSM) for the subject of Moral Education became universal, such as being responsible and grateful. Therefore, there is a need for research that can help all parties, especially teachers of Moral Education, to always plan the best teaching strategies to have an effective impact on students, especially from the aspect of sustainable thinking in students towards the environment. The second suggestion is that future researchers can observe the effectiveness of the level of sustainable thinking among Moral Education students through various methods, including active learning during the teaching and learning process. This will be able to help many parties, especially educators, to design the teaching process more comprehensively.

4. Conclusion

This study has found that good thinking is very important in ensuring that sustainable development goals are achieved. This coincides with six research findings that refer to the level of sustainable thinking and the importance of applying environmental education in achieving sustainability. Among them is that improvements in the syllabus and delivery methods of environmental education, as well as information literacy in education, can encourage sustainable thinking to achieve sustainable development. The analysis in this article also showed the importance of the Moral Education curriculum in helping students always think based on good moral judgment for the sake of universal well-being. Thus, all parties need to work together to ensure that students have a sustainable mindset in line with the goals of sustainable development (SDG). The implementation of environmental education in schools is one of the best steps. However, if this step proceeds without any necessary improvement and action, especially from the Ministry of Education Malaysia, the goal of sustainable development will become difficult to achieve. Therefore, actions need to be taken more drastically so that students can understand the importance of environmental sustainability. This research is expected to be a resource for future research related to the environment.

Acknowledgement

Special thanks to my supervisor, Associate Professor Dr. Rabiatul-Adawiah Ahmad Rashid in making it possible for this paper to be published.

© 2022 by the authors. Published by Secholian Publication. This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).

Funding

This study received no funding.

Conflict of Interests

The authors reported no conflicts of interest for this work and declare that there is no potential conflict of interest with respect to the research, authorship, or publication of this article.

References

Ardoin, N. M., Bowers, A. W., Roth, W., Holthuis, N., Ardoinhttps, N. M., & Bowers, A. W. (2018). Environmental education and K-12 student outcomes: A review and analysis of research. *The Journal of Environmental Education*, *49*(1), 1–17. https://doi.org/10.1080/00958964.2017.1366155

Arslan, S. (2012). The Influence of Environment Education on Critical Thinking and Environmental Attitude. *Procedia - Social and Behavioral Sciences*, 902–909. https://doi.org/10.1016/j.sbspro.2012.09.579

Begum, A., Jingwei, L., Haider, M., Ajmal, M. M., Khan, S., & Han, H. (2021). Impact of environmental moral education on pro-environmental behaviour: Do psychological empowerment and islamic religiosity matter? *International Journal of Environmental Research and Public Health*, *18*(4), 1–19. https://doi.org/10.3390/ijerph18041604

Biplap Roy, & Rajidulhoque. (2015). Environmental Education and Sustainable Tourism: a Model To Fit the Tourism Growth in Cox'S Bazar. *International Journal of Business and General Management (IJBGM)*, *4*(4), 45–54. www.iaset.us/view_archives.php?year=2015&jtype=2&id=32&details=archives

Boca, G. D., & Saraçli, S. (2019). Environmental education and student's perception, for sustainability. *Sustainability (Switzerland)*, *11*(6), 1–18. https://doi.org/10.3390/su11061553

Dada, D. O., Eames, C., & Calder, N. (2017). Impact of Environmental Education on Beginning Preservice Teachers' Environmental Literacy. *Australian Journal of Environmental Education*, *33*(3), 201–222. https://doi.org/10.1017/aee.2017.27

Edsand, H. E., & Broich, T. (2020). The Impact of Environmental Education on Environmental and Renewable Energy Technology Awareness: Empirical Evidence from Colombia. *International Journal of Science and Mathematics Education*, *18*(4), 611–634. https://doi.org/10.1007/s10763-019-09988-x

Fethiye Ozis, Laureh, R. ., & Nihal Sarikaya. (2020). Mixed Method Approach to Evaluate Sustainability Thinking among the Next Generation of Civil and Environmental Engineers. *American Society for Engineering Education*, 31. https://doi.org/10.18260/1-2-34979

Fragkoulis, I., & Koutsoukos, M. (2018). Environmental Education through Art: A Creative Teaching Approach. *Education Quarterly Reviews*, *1*(1). https://doi.org/10.31014/aior.1993.01.01.8

Gericke, N., Boeve-de Pauw, J., Berglund, T., & Olsson, D. (2019). The Sustainability Consciousness Questionnaire: The theoretical development and empirical validation of an evaluation instrument for stakeholders working with sustainable development. *Sustainable Development*, *27*(1), 35–49. https://doi.org/10.1002/sd.1859

© 2022 by the authors. Published by Secholian Publication. This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).

Haliza Abdul Rahman. (2017). Usaha dan cabaran dalam mengaplikasikan Pendidikan Alam Sekitar dalam sistem persekolahan Di Malaysia. *Asian Journal of Environment, History and Heritage*, *1*(2), 61–70. http://spaj.ukm.my/ajehh/index.php/ajehh/article/view/33

Haliza Abdul Rahman. (2020, February 3). Pendidikan lahir generasi milenia cinta alam sekitar. *Berita Harian*. https://www.bharian.com.my/kolumnis/2020/02/652142/pendidikan-lahir-generasi-milenia-cinta-alam-sekitar

Hayrol Azril Mohamed Shaffril, Asnarukhadi Abu Samah, & Syafila Kamarudin. (2021a). Speaking of the devil : a systematic literature review on community preparedness for earthquakes. *Natural Hazards*, *108*(3), 2393–2419. https://doi.org/10.1007/s11069-021-04797-4

Hayrol Azril Mohamed Shaffril, Asnarulkhadi Abu Samah, & Samsul Farid Samsuddin. (2021b). Guidelines for developing a systematic literature review for studies related to climate change adaptation. *Environmental Science and Pollution Research*, 22265–22277.

Higgins, J. P. T., Altman, D. G., Gøtzsche, P. C., Jüni, P., Moher, D., & Oxman, A. D. (2011). The Cochrane Collaboration ' s tool for assessing risk of bias in randomised trials. *BMJ,* 343:d5928–d5928. https://doi.org/10.1136/bmj.d5928

Isabel Novo-Corti, Maria Teresa Garcia-Alvarez, & Laura Varela-Candamio. (2018). The importance of environmental education in the determinants of green behavior: A meta-analysis approach. *Journal of Cleaner Production*, *170*, 1565–1578. https://doi.org/10.1016/j.jclepro.2017.09.214

Kementerian Pendidikan Malaysia. (2019). *Buku Panduan Pengurusan Mata Pelajaran Pendidikan Moral*. Kementerian Pendidikan Malaysia

Karpan, I., Chernikova, N., Motuz, T., Bratanich, B., & Lysokolenko, T. (2020). Conceptual principles of education for sustainable development. *European Journal of Sustainable Development*, *9*(2), 99–114. https://doi.org/10.14207/ejsd.2020.v9n2p99

Kaur, B. (2019). A Study On Environmental Awareness Among College Students. *International Journal of Scientific and Research Publications (IJSRP)*, *9*(11), p9550. https://doi.org/10.29322/ijsrp.9.11.2019.p9550

Liu, S., & Guo, L. (2018). Based on environmental education to study the correlation between environmental knowledge and environmental value. *Eurasia Journal of Mathematics, Science and Technology Education*, *14*(7), 3311–3319. https://doi.org/10.29333/ejmste/91246

Mardiyah Rahim. (2021). *Kesan Pembelajaran Berasaskan Masalah Terhadap Pencapaian Teknologi Hijau, Pemikiran Lestari Dan Tingkah Laku Lestari*. Universiti Sains Malaysia.

Muhd Ibrahim Muhamad Damanhuri, Durairaj Ehambron, & Marlizah Yusuf. (2016). Tahap kesedaran dan amalan pendidikan alam sekitar dalam kalangan pelajar Tingkatan 4 aliran sains di daearah Hulu Selangor. *Geografi*, *4*(2), 28–35.

Murzi, H., Mazzurco, A., Pikaar, I., & Gibbes, B. (2019). Measuring development of environmental awareness and moral reasoning: A case-study of a civil engineering course. *European Journal of Engineering Education*, *44*(6), 954–968. https://doi.org/10.1080/03043797.2019.1566300

Nazmi Durkan. (2017). Examining the behavior and thinking levels of secondary school students (6th-8th GRADES) towards the environment according to gender. *Educational Research and Reviews*, *12*(22), 1080–1085. https://doi.org/10.5897/err2017.3334

Norpishah Ahmad, Rosnani Ahmad, & Rozimah Tahir. (2017). Kitar Semula Sisa Pepejal

© 2022 by the authors. Published by Secholian Publication. This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).

di Politeknik Sultan Salahuddin Abdul Aziz Shah. *Advance Journal of Technical and Vocational Education, 1*(June), 70–73

Nur Syuhada Mustakim, Muhammad Wafi Ramli, & Chan, N. W. (2019). Kesedaran komuniti terhadap isu pencemaran sungai di Sungai Pinang, Pulau Pinang. *Malaysian Journal of Society and Space*, *15*(3), 27–39. https://doi.org/10.17576/geo-2019-1503-03

Nurul Hafizah Md Nor, & Abdul Aziz Othman. (2016). Tahap Pengetahuan Dan Amalan Berkaitan Alam Sekitar Di Kalangan Pelajar Inasis BSN, UUM. *Journal Technology and Logistic*, 1277–1286.

Nurul Hidayah Liew Abdullah, Shafii, H., & Seow Ta Wee. (2013). Pendidikan Alam Sekitar Sebagai Medium Utama dalam Konteks Meningkatkan Kesedaran Alam Sekitar: Satu Kajian Persepsi dari Sudut Pandangan Pentadbir, Guru, Ibu Bapa dan Murid. *Prosiding Seminar Antarabangsa Ke-6 Ekologi, Habitat Manusia & Perubahan Persekitaran Di Alam Melayu*, 10.

Olsson, D. (2018). *Student Sustainability Consciousness*. Karlstads Universites.

Olsson, D., Gericke, N., & Chang Rundgren, S. N. (2016). The effect of implementation of education for sustainable development in Swedish compulsory schools – assessing pupils' sustainability consciousness. *Environmental Education Research*, *22*(2), 176–202. https://doi.org/10.1080/13504622.2015.1005057

Palmberg, I., Hofman-Bergholm, M., Jeronen, E., & Yli-Panula, E. (2017). Systems thinking for understanding sustainability? Nordic student teachers' views on the relationship between species identification, biodiversity and sustainable development. *Education Sciences*, *7*(3). https://doi.org/10.3390/educsci7030072

Repanovici, A., Rotaru, C. S., & Murzea, C. (2021). Development of Sustainable Thinking by Information Literacy. *Sustainability, MDPI*, *1287*(13).https://doi.org/10.3390/

Shutaleva, A., Nikonova, Z., Savchenko, I., & Martyushev, N. (2020). Environmental education for sustainable development in Russia. *Sustainability (Switzerland)*, *12*(18), 1–26. https://doi.org/10.3390/su12187742

Sidek Baba. (2019, January 16). Maksud pendidikan acuan keMalaysiaan. *Berita Harian*. https://www.bharian.com.my/kolumnis/2019/01/520438/maksud-pendidikan-acuan-kemalaysiaan

Uddin, M. R., Shimizu, K., & Widiyatmoko, A. (2020). Assessing secondary level students' critical thinking skills: Inspiring environmental education for achieving sustainable development goals. *Journal of Physics: Conference Series*, *1567*(2). https://doi.org/10.1088/1742-6596/1567/2/022043

Vasanthan Gurusamy, & Nadarajan Thambu. (2018). Development of moral motivation through acting activities in teaching and learning of moral education in secondary schools. *Muallim Journal of Social Sciences and Humanities*, *2*(4), 234–250.

Velempini, K. (2017). Infusion or confusion: A meta–analysis of Environmental Education in the 21st century curriculum of Botswana. *Africa Education Review*, *14*(1), 42–57. https://doi.org/10.1080/18146627.2016.1224560

Vishalache Balakrishnansulam. (2021, February 21). *The regression in Moral Education | The Star*. The Star. https://www.thestar.com.my/news/education/2021/02/21/the-regression-in-moral-education

Xiao, Y., & Watson, M. (2019). Guidance on Conducting a Systematic Literature Review. *Journal of Planning Education and Research, 39*(1), 93–112. https://doi.org/10.1177/0739456X17723971

Yi-Chen, L., & Li-Hsun, P. (2020). Effective teaching and activities of excellent teachers for the sustainable development of higher design education. *Sustainability (Switzerland)*, *12*(1), 1–27. https://doi.org/10.3390/su12010028

© 2022 by the authors. Published by Secholian Publication. This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).

Younger, P. (2010). Using Google Scholar to Conduct a Literature Search. *Nursing Sandard*, *24*(45), 40–46.

Zuhaira Nasrin Mohamed Zin, & Zul'azmi Yaacob. (2020). Pembangunan Mentaliti Lestari Masyarakat Malaysia. *E-Journal of Islamic Thought and Inderstanding*, *2*, 38–53.

© 2022 by the authors. Published by Secholian Publication. This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).