



A STUDY ON THE ENVIRONMENTAL LITERACY AMONG HIGHER SECONDARY STUDENTS

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RESEARCH ARTICLE



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DOI:

<https://doi.org/10.70096/tssr.260405032>

Abstract

Environmental literacy refers to having sufficient knowledge and understanding of the environment, along with the willingness and ability to act responsibly toward it. The primary aim of this study was to examine the environmental literacy of higher secondary students under the West Bengal Council of Higher Secondary Education (WBCHSE) in Purulia district. The researchers adopted a descriptive survey method. The Environmental Literacy Scale for Adults (ELSA), developed by Atabek-Yigit et al. (2014), was used to collect data from 400 higher secondary students. Descriptive and inferential statistics were employed to analyse the collected data. The findings revealed significant differences in environmental literacy based on gender, academic stream, and locality; specifically, female, science, and rural students possessed significantly higher levels of environmental literacy compared to their male, arts, and urban counterparts.

Keywords: *Environmental Literacy, Higher Secondary Students, WBCHSE, Purulia District, Academic Stream, Locality*

Introduction

The debate on environment and development has gained incredible importance at the global, national and local levels (Saha, 2012a). To save the environment, it is necessary to develop environmental awareness. For that, we need environmental literacy (EL). EL develops knowledge, awareness, attitudes, and skills to understand environmental problems, make informed decisions, conserve natural resources, and promote sustainable development for future generations. EL refers to the knowledge, awareness, attitudes, skills, and responsibility required to understand environmental issues, make informed decisions, and protect the natural environment sustainably. The emergence of destructive environmental problems can be reduced in societies if its citizens develop environmental literacy (Hsu & Roth, 1996; Olson & Rothkrug, 1991; Wilke et al., 1995). The presumption here is that environmentally literate citizens will demonstrate more responsible behaviour (REB) toward protecting the environment (Shamuganathan & Karpudewan, 2015; Stevenson, 2007). Through educational institutions such as colleges and universities, society has an opportunity to foster a sense of citizenship in a multitude of ways. EL evolved from traditional nature knowledge to modern environmental education, gaining global recognition through the 1972 Stockholm Conference, 1975 Belgrade Charter, and 1977 Tbilisi Declaration. EL primarily focused on knowledge acquisition and understanding environmental concepts (Coyle, 2005), recent research has expanded the understanding of EL to a complex and multifaceted construct that extends beyond factual knowledge and encompasses various cognitive, affective, and behavioural aspects (Hunter & Jordan 2019).

Review of the Related Literature

Negev et al. (2008) conducted a study on evaluating the environmental literacy of Israeli elementary and high school students and found a significant correlation between knowledge and behaviour. Tuncer et al. (2009) explored a study on assessing pre-service teachers' environmental literacy in Turkey as a mean to develop teacher education programs. Study showed that environmental background of pre-service teachers was 46 positively related to environmental literacy and attitudes along with other uses affected significantly by gender. Dwyer (2011) conducted a study on the relationship between energy literacy and environmental sustainability. The findings of this study suggested that discussion of sustainability with disaster themes triggers anxiety that interferes with the development of ERB. Saha et al. (2012) studied comparatively of gender in relation to socio-economic position, environmental consciousness and creativity in the Birbhum district and revealed that there was no significant difference between the schools of male and female pupils in relation to socio-economic level, environmental awareness and creativity. Saha (2012b) conducted a study to provide information and relation between creativity and environmental awareness

in Birbhum district. Locke et al. (2013) carried out a study on environmental education and eco-literacy as tools of education for sustainable development. The researcher found that external national political, social, and economic forces were important to the program's success, and illustrate the importance of developing and programs that address the specific needs and issues of the local region. Saha and Maji (2013) carried out a study on building the sustainable development through environmental education. The environmental education explored by both the learners and the lesson teacher can create such an atmosphere. Jannah et al. (2013) examined on impact of environmental education kit on students' environmental literacy and found that the level of environmental literacy among students based on gender and class stream are at moderate and low level. Saribas et al. (2014) conducted a study on the relationship between environmental literacy and self-efficacy beliefs toward environmental education. Findings showed that the participants' environmental attitudes, perception of behaviour, and concern for the environment seem to be stronger than their knowledge and self-efficacy beliefs. Ozgurler and Cansaran (2014) studied on environmental literacy and sustainable development among graduate students and found that environmental knowledge of graduate students was not at a high level but their approach to environment and environmental issues, interest of environmental education was at a high level. Kaya and Elster (2015) carried out a study on German students' environmental literacy in science education based on Pisa data. There was a significant relationship between both classic literature and books on art, music, or design that students have at home, number of musical instruments at home, and EL. Maknun et al. (2017) explored on the level of environmental literacy toward vocational high school students in west java province. The results showed that the knowledge and understanding of vocational students about the environment, including the unfavourable category.

Nuneza and Cloresb (2017) conducted a study on environmental literacy of k-10 student completers. Results showed that the student completers of K-10 grade levels have moderate level of environmental literacy and environmental knowledge and behaviour and high level of environmental attitude and sensitivity. Febriasari and Supriatna (2017) studied on enhance environmental literacy through problem-based learning and found that student's environmental literacy can be improved through classroom learning by applying Problem Based Learning model. Singleton (2017) carried out a study on environmental literacy and sustainability values: a content analysis of environmental education standards Julie Singleton. The findings showed state standards and national guidelines adequately address ecological integrity principles, but not environmental justice principles. Szcztyko et al. (2018) studied on development and validation of the environmental literacy instrument for adolescents. Sakshi and Gupta (2018) conducted a study on effect of environmental education for sustainable development on the development of environmental awareness among secondary school student and found that the intervention programme was effective in developing the environmental awareness among secondary school students. Wong et al (2018) conducted a study on conceptualizing environmental literacy and factors affecting pro-environmental behaviour. Veisi et al. (2018) explored on assessing environmental literacy of university students. The findings indicated that students had a positive attitude and a high degree of concern and showed sensitivity to the environment, but they had only low to moderate levels of knowledge. Lloyd-Strovas et al. (2018) examined on environmental literacy of undergraduate college students and developed of the environmental literacy instrument (ELI). Kaya and Elster (2019) studied on dimensions affecting environmental literacy, and environmental perceptions influencing science literacy. Wilujeng et al. (2019) conducted a study on the effectiveness of education for environmentally sustainable development to enhance environmental literacy in science education a case study of hydropower. The findings of this research showed that the mean score of the experimental class was greater than the control class, and there was a remarkable difference in environmental literacy between the experimental and control class. Pujiati et al. (2020) studied a case on impact of social influence and environmental literacy on green consumption behaviour of Indonesian students. Mihanpour et al. (2020) explored on assessment of environmental literacy: a case study of Yazd citizens' awareness, attitudes, and practices in 2017. A positive correlation was found between awareness, attitude, and practice scores. Klein et al. (2021) conducted a study on contribution of an intergenerational sustainability leadership project to the development of students 'environmental literacy'. The findings derived from the ELIN and from the qualitative analysis of the interviews are complementary, together showing EL in fine details as a multifaceted literacy. Masemene and Msezane (2021) explored on environmental literacy components in promoting sustainable behaviour. The finding showed that challenges in developing environmental literacy do not solely emanate from teachers and schools, but from a lack of, and inconstant systems and policies aimed at guiding the implementation of EE, and a lack of teachers' development and support.

Tomas et al. (2022) conducted a study on environmental literacy and its impact on sustainable pedagogical behaviour of basic education teachers, lima-Peru. The results obtained in the study that environmental literacy (E.L.) has an impact on a certain percentage of the sustainable pedagogical behaviours of basic education teachers in Lima-Peru. Ors (2022) studied on a measurement of the environmental literacy of nursing students for a sustainable environment. The results showed 38 that statistically significant differences in the dimensions of environmental literacy based on gender and whether the students had taken environment-related courses. Nugraha et al. (2022) carried out on profile of learning environmental literacy in elementary school and showed environmental knowledge profiles in school local content have been well applied in the curriculum which can be seen in the conditioning of the learning environment that blends with nature. Hermawan et al. (2022) conducted a study on student's environmental literacy an educational program reflection for a sustainable environment. The study revealed that environmental literacy of high school students was categorized as moderate. Haldar et al. (2022) studied to examine the attitudes of the trainee teachers of the Purulia District of West Bengal toward sustainable development were studied. It was found that the attitudes did not differ significantly on the basis of gender, rural or urban background and arts or science stream. Volkmann and Fraunhofer (2023) conducted a study on environmental literacy, sustainable education and post humanist pedagogy: teaching the climate crisis in a global, transatlantic online setting. The researchers found out cultural and linguistic diversity in both

curriculum design and pedagogy, this approach encourages learners to develop the transcultural skills needed to effect positive change on a local and global scale. Anawati and Utari (2023) conducted a study on increasing environmental literacy to support environmental conservation in Indonesia. The results indicated that technical guidance on waste bank management, environmental book donations, reading promotion, writing about environmental preservation, and organic waste management were all efforts to increase environmental literacy. Gok and Boncukcu (2023) conducted a study on the effect of problem-based learning (PBL) on middle school student's environmental literacy and problem-solving skills. The results revealed that PBL was more effective in developing environmental attitudes than curriculum-based instruction. Lestari et al. (2023) have conducted a study on an innovative approach to environmental literacy: the sustainable RADEC learning model for elementary schools. This study aimed to design and develop an Education of Sustainable Development-oriented RADEC learning design model for enhancing the environmental literacy of elementary school students. This conclusion is supported by the mean score of 3.98 and a standard deviation of 0.22, showing a consistent range of responses among experts. In other words, the experts unanimously agree that the product design is appropriate for classroom learning. Jimola and Omodun (2023) examined on environmental literacy and learning resources: panacea to emerging drift in communities for sustainable environmental development. The findings also revealed inhibitors to the use of picture books and animation cartoons.

Llopiz-Guerra et al. (2024) examined on importance of environmental education in the context of natural sustainability. Ariyatun et al. (2024) carried out a comprehensive study on assessing the environmental literacy profile in higher education for sustainable development. The results showed that students have a grasp of concepts and hold positive attitudes but there is still room for improvement in translating this knowledge into consistent sustainable actions. Jia and Wang (2024) conducted a study on city-level sustainable development impacts on environmental literacy feelings toward nature, environmental knowledge, and pro environmental behaviour and found that environmental education should be tailored to a city's sustainable development level to better encourage pro-environmental behaviour. Azizah et al. (2025) conducted a study on environmental education in schools, sustainability and hope. The study revealed that teachers have high expectations for schools, fellow teachers, and students. Lin et al. (2025) studied on environmental literacy among the general public in Chiayi County, Taiwan. The results indicated that while respondents demonstrate high awareness of environmental issues and positive attitudes toward sustainability, there were significant gaps in environmental knowledge and action skills. Savitri et al. (2025) have conducted a study on identification of sustainable environmental literacy needs as a basis for developing SDGS-based instruments. This study aimed to identify the need for sustainable environmental literacy as a basis for developing measurement instruments that were relevant to the context of education and global environmental challenges. This finding emphasized the importance of instruments that were able to describe environmental literacy conditions holistically to support transformative education and form agents of change who care about environmental sustainability. Husamah et al. (2025) conducted a study on the relationship between environmental literacy, ecological literacy, and science for sustainability a systematic literature review. The results indicated that while respondents demonstrate high awareness of environmental issues and positive attitudes toward sustainability, there are significant gaps in environmental knowledge and action skills. In grounding the present study, several notable and relevant investigations within this domain were thoroughly reviewed, including Erdoğan et al. (2009); Hollweg et al. (2011); Adhikari et al. (2023a; 2023b); Mahato et al. (2023); Mahato et al. (2023); Mahato et al. (2023); Das and Mahato (2024); Mahato and Das (2024a; 2024b); Das (2025a; 2025b); Mondal (2025); Roy and Mahato (2025); Patra and Mahato (2025); Mandal and Mondal (2026) etc.

Objectives of the Study

- I. To compare the environmental literacy between female and male higher secondary students.
- II. To compare the environmental literacy between arts and science higher secondary students.
- III. To compare the environmental literacy between rural and urban higher secondary students.

Hypotheses of the Study

H₀₁: There is no significant difference in environmental literacy between female and male higher secondary students.

H₀₂: There is no significant difference in environmental literacy between arts and science higher secondary students.

H₀₃: There is no significant difference in environmental literacy between rural and urban higher secondary students.

Methodology

Research Design: Descriptive survey method was used for the study.

Population: The population of this study included all the higher secondary students from Purulia district of West Bengal studying in different schools under the WBCHSE.

Sample and Sampling Techniques: 400 higher secondary arts and science students from government sponsored and government aided schools studying under the WBCHSE were selected as the sample for this study. The study employed the stratified random sampling technique to conduct this study.

Tool Used: The researchers have used the Environmental Literacy Scale for Adults (ELSA), which was developed by Atabek-Yigit et al. (2014). It uses a 5-point Likert type scale.

Data Analysis and Interpretation

Table :1 Results of ‘t’ test for Environmental Literacy regarding Gender of higher secondary students

Variables	N	M	Std. Deviation	df	‘t’	Remarks
Female	244	73.61	14.982	398	2.180	Significant at 0.05 level.
Male	156	69.94	18.390			

Hypothesis Testing 1: From Table 1, the mean scores for female and male higher secondary students were 73.61 and 69.94, respectively, while the Std. Deviation for female and male students were 14.982 and 18.390. At the 0.05 level, the t-test result of 2.180 with df of 398 is significant. A discernible difference between female and male higher secondary students is indicated by the calculated statistics. Therefore, the null hypothesis, H_{01} : ‘There is no significant difference in environmental literacy between female and male higher secondary students’ is failed to be accepted, the result indicated that female and male higher secondary students differed significantly. Hence, a significant difference in environmental literacy was observed between female and male higher secondary students.

Table :2 Results of ‘t’ test for Environmental Literacy regarding stream of higher secondary students

Variables	N	M	Std. Deviation	df	‘t’	Remarks
Arts	314	69.92	17.383	398	5.428	Significant at 0.05 level.
Science	86	80.43	8.539			

Hypothesis Testing 2: From Table 2, the mean scores for arts and science higher secondary students were 69.92 and 80.43, respectively, while the Std. Deviation for arts and science students were 17.383 and 8.539. At the 0.05 level, the t-test result of 5.428 with df of 398 is significant. A discernible difference between arts and science higher secondary students is indicated by the calculated statistics. Therefore, the null hypothesis, H_{02} : ‘There is no significant difference in environmental literacy between arts and science higher secondary students’ is to be rejected, the result indicated that arts and science higher secondary students differed significantly. Hence, a significant difference in environmental literacy was observed between arts and science higher secondary students.

Table: 3 Results of ‘t’ test for Environmental Literacy regarding locality of higher secondary students

Variables	N	M	Std. Deviation	df	‘t’	Remarks
Rural	317	76.15	14.077	398	10.685	Significant at 0.05 level.
Urban	83	57	16.191			

Hypothesis Testing 3: From Table 3, the mean scores for rural and urban higher secondary students were 76.15 and 57, respectively, while the Std. Deviation for rural and urban students were 14.077 and 16.191. At the 0.05 level, the t-test result of 10.685 with df of 398 is significant. A discernible difference between arts and science higher secondary students is indicated by the calculated statistics. Therefore, the null hypothesis, H_{03} : ‘There is no significant difference in environmental literacy between rural and urban higher secondary students’ is failed to be accepted, the result indicated that rural and urban higher secondary students differed significantly. Hence, A significant difference in environmental literacy was observed between rural and urban higher secondary students.

Findings of the study

1. Higher environmental literacy is exhibited by female higher secondary students than by male students. however, a significant difference in environmental literacy is observed between female and male higher secondary students.
2. Higher environmental literacy is exhibited by science higher secondary students than by arts students. however, a significant difference in environmental literacy is observed between arts and science higher secondary students.
3. Higher environmental literacy is exhibited by rural higher secondary students than by urban students. however, a significant difference in environmental literacy is observed between rural and urban higher secondary students.

Educational Implications

Educational Implications may be included:

- I. The results of the study may motivate the education authorities to upgrade the environmental education in the higher secondary syllabus. Environmental literacy should be integrated into the entire curriculum for a holistic perspective of environmental problems and sustainable methods.
- II. Responsible environmental behaviour can happen through increasing environmental awareness among students. Schools and colleges should provide opportunities for students to participate in environment friendly activities such as tree plantation, waste management, water conservation and protection of biodiversity.
- III. Schools should employ experiential learning methods including field trips, nature camps, environmental surveys, and community projects. These exercises allow the students to apply academic knowledge to environmental problems of the real world.
- IV. Environmental literacy education can enhance students’ critical thinking abilities by encouraging them to analyse environmental concerns and search for sustainable solutions, thereby preparing them to be informed citizens and future decision-makers.

The findings could lead schools, local communities, and environmental agencies to work together to raise awareness and tackle local environmental issues through cooperative activities and outreach programs.

- V. The findings can be utilized by the educational policymakers for framing the policies on environmental literacy and sustainable development education at secondary and higher secondary levels.

Conclusion

This study aimed to compare the level of environmental literacy of higher secondary students toward sustainable development. The study results indicated that environmental literacy is significant components of students' general consciousness and readiness to face modern environmental issues. The findings showed that students possess different levels of knowledge, awareness, and concern about environmental problems and sustainable methods. Students with higher knowledge of the environment tend to have more positive views toward sustainability, environmental protection, and responsible resource use. To summarize, environmental literacy is crucial to confronting the present and future environmental issues. Educational institutions may contribute significantly to a more sustainable, egalitarian, and ecologically responsible society by promoting environmental literacy and developing positive attitudes toward sustainability

Acknowledgment: No

Author's Contribution: Payel Choudhury: Data Collection, Literature Review, Methodology, Analysis, Drafting, Referencing; Shankar Mondal: Drafting, Referencing

Funding: No

Declaration: The author/s has/have given consent for the publication.

Competing Interest: No

References

1. Adhikari, A., Gayen, P., Sutradhar, A., & Sen, S. (2023a). A Measure for Measure: Statistics in Education. *International Journal of Research Publication and Reviews*, 4(5), 4239-4243.
2. Adhikari, A., Gorain, S., Gayen, P., Pal, I., & Sen, S. (2023b). Studying the Differences: A Review on t-Test. *International Research Journal of Education and Technology*, 5(5), 338-349.
3. Anawati, S., & Utari, S. (2023). Increasing environmental literacy to support environmental conservation: case study in Jebres, Indonesia. *E3S Web of Conferences*, 444, 03004.
4. Ariyatun, A., Sudarmin, S., Wardani, S., Saptono, S., Rusilowati, A., & Sulistyaningsih, T. (2024). A comprehensive study: Assessing the environmental Literacy Profile in Higher Education for Sustainable Development. *Advances in Social Science, Education and Humanities Research/Advances in Social Science, Education and Humanities Research*, 80–94. https://doi.org/10.2991/978-2-38476-275-0_7
5. Atabek-Yigit, E., Köklükaya, N., Yavuz, M., & Demirhan, E. (2014). Development and Validation of Environmental Literacy Scale for Adults (ELSA). *Journal of Baltic Science Education*, 13(3), 425-435. <https://doi.org/10.33225/jbse/14.13.425>
6. Azizah, H., Henny, H., Nengsih, Y. K., & Rendana, M. (2025). Environmental Education in Schools: Sustainability and Hope. *Discover Sustainability* 6(41), 1-12.
7. Coyle, K. (2005). *Environmental Literacy in America: What Ten Years of NEETF/Roper Research and Related Studies Say about Environmental Literacy in the US*. National Environmental Education & Training Foundation. Washington. <https://files.eric.ed.gov/fulltext/ED522820.pdf>.
8. Dwyer, C. (2011). The Relationship between Energy Literacy and Environmental Sustainability. *Low Carbon Economy*, 02(03), 123-137.
9. Das, B. (2025a). Understanding Internet Addiction Through Clustering: A Study of Undergraduate Students in Purulia District. *The Social Science Review A Multidisciplinary Journal*, 3(2), 247-257. <https://doi.org/10.70096/tssr.250302034>
10. Das, B. (2025b). Digital Dependence: Analysing Internet Addiction Across Demographics Among Ug Students of Purulia District, West Bengal. *The Social Science Review A Multidisciplinary Journal*, 3(1), 132-137. <https://doi.org/10.70096/tssr.250301024>
11. Das, B., & Mahato, S. (2024). Analysing Positive Mental Health Among Students in Purulia District, West Bengal, Using Clustering Techniques, *The Social Science Review A Multidisciplinary Journal*, 2(3), 12-26.
12. Erdoğan, M., Kostova, Z., & Marcinkowski, T. (2009). Components of Environmental Literacy in Elementary Science Education Curriculum in Bulgaria and Turkey. *EURASIA Journal of Mathematics, Science and Technology Education*, 5(1). 15-26. <https://doi.org/10.12973/ejmste/75253>
13. Febriasari, L. K., & Supriatna, N. (2017). Enhance Environmental Literacy through Problem Based Learning. *Journal of Physics Conference Series*, 895(1), 1-5.
14. Gok, G., & Boncukcu, G. (2023). The Effect of Problem-Based Learning on Middle school students' environmental literacy and Problem-Solving skills. *Journal of Science Learning*, 6(4), 414–423.
15. Haldar, P., Roy, S., Gorain, S. C., Adhikari, A., & Saha, B. (2022). Measuring Attitude towards Sustainable Development among Trainee Teachers in Purulia District of West Bengal. *American Journal of Educational Research*, 10(12), 682-696.
16. Hermawan, I. M. S., Suwono, H., Paraniti, A. A. I., & Wimuttipanya, J. (2022). Student's environmental literacy: An educational program reflection for sustainable environment. *JPBI (Journal Pendidikan Biologi Indonesia)*, 8(1), 1–9.
17. Hollweg, K. S., Taylor, J. R., Bybee, R. W., Marcinkowski, T. J., McBeth, W. C., & Zoido, P. (2011). *Developing a Framework for Assessing Environmental Literacy*. Washington DC: North American Association for Environmental Education.
18. Hsu, S., & Roth, R. E. (1996). An assessment of environmental knowledge and attitudes held by community leaders in the Hualien area of Taiwan. *The Journal of Environmental Education*, 28(1), 24–31. <https://doi.org/10.1080/00958964.1996.9942812>

19. Hunter, R. H., & R. C. Jordan. (2019). The TELA: A New Tool for Assessing Educator Environmental Literacy. *Interdisciplinary Journal of Environmental and Science Education*, 15 (1), e02201. <https://doi.org/10.29333/ijese/6286>
20. Husamah, H., Rahardjanto, A., Permana, T. I., & Lestari, N. (2025). The relationship between environmental literacy, ecological literacy, and science for sustainability: A systematic literature review. *Research and Development in Education (RaDeN)*, 5(1), 351–364.
21. Jannah, M., Halim, L., Meerah, T. S. M., & Fairuz, M. (2013). Impact of Environmental Education kit on students' environmental literacy. *Asian Social Science*, 9(12), 1-12.
22. Jia, F., & Wang, W. (2024). City-level sustainable development impacts on environmental literacy: feelings toward nature, environmental knowledge, and pro-environmental behaviour. *Environmental Education Research*, 30(8), 1263–127
23. Jimola, F. E., & Omodun, K. J. (2023). Environmental literacy and learning resources: Panacea to emerging drift in communities for sustainable environmental development. *International Online Journal of Primary Education (IOJPE)*, 12(4), 245-262.
24. Kaya, V. H., & Elster, D. (2015). German students' environmental literacy in science education based on Pisa data. *Science Education International* 29(2), 75-87
25. Kaya, V., & Elster, D. (2019). Dimensions affecting environmental literacy, and environmental perceptions influencing science literacy. *International e-Journal of Educational Studies (IEJES)*, 3(6), 70-77.
26. Klein, S., Watted, S., & Zion, M. (2021). Contribution of an intergenerational sustainability leadership project to the development of students' environmental literacy. *Environmental Education Research*, 27(12), 1723–1758.
27. Lestari, H., Rahmawati, I., Ali, M., Sopandi, W., & Wulan, A. R. (2023). An innovative approach to environmental literacy: the Sustainable RADEC learning Model for elementary schools. *Al Ibtida Journal Pendidikan Guru MI*, 10(2), 189-210.
28. Lin, S., Sah, A. K., & Hong, Y. (2025). Environmental literacy among the general public in Chiayi County, Taiwan. *Sustainability*, 17(7), 1-30.
29. Llopiz-Guerra, K., Ruiz, D. U., Hernandez, R. M., Mejia, V. L. V., Del Rocio Jara Nunayalle, J., & Sanchez, K. R. (2024). Importance of environmental education in the context of natural sustainability. *Natural and Engineering Sciences*, 9(1), 57–71.
30. Lloyd-Strovas, J., Moseley, C., & Arsuffi, T. (2018). Environmental literacy of undergraduate college students: Development of the environmental literacy instrument (ELI). *School Science and Mathematics*, 118(3-4), 84–92.
31. Locke, S., Russo, O. R., & Montoya, C. (2013). Environmental education and eco-literacy as tools of education for sustainable development. *Journal of Sustainability Education*, 4, 1-13.
32. Maknun, J., Barliana, M. S., & Cahyani, D. (2017). The Level of Environmental Literacy toward Vocational High School Students in West Java Province. *Innovation of Vocational Technology Education*, 12(2). 66-70.
33. Mahato, D., Gayen, P., & Mahato, R. C. (2023). Relationship Between Academic Resilience and Internet Addiction of Undergraduate Students of Purulia District of West Bengal- A Study. *EPRA International Journal of Multidisciplinary Research*, 9(3), 103-106.
34. Mahato, M., Gayen, P., & Mahato, R.C. (2023). Relationship Between Self-Efficacy and M-Learning of Undergraduate Students of Purulia District of West Bengal. *International Journal of Research Publication and Reviews*, 4(4), 3219-3222.
35. Mahato, R.C., Sen, S., & Adhikari, A. (2023). A Study of DASS-21 and the Self-Efficacy Scale on Post-Graduate Students. *International Journal of Research Publication and Reviews*, 4(6), 4249-4255.
36. Mahato, S., & Das, B. (2024a). Comparison of Environmental Attitude by Applying T-Test and Mahalanobis Distance (MD) of Undergraduate Students in Purulia, *The Social Science Review A Multidisciplinary Journal*, 2(5), 133-140.
37. Mahato, S., & Das, B. (2024b). Mental Well-Being Among Students with Respects to Gender, Institution and Residence: Insights from Purulia District, West Bengal. *The Social Science Review: A Multidisciplinary Journal*, 2(2), 164-175.
38. Masemene, K. J., & Msezane, S. B. (2021). Exploring environmental literacy components in promoting sustainable behaviour: a case study of rural primary schools. *Journal for the Education of Gifted Young Scientists*, 9(3), 233-249.
39. Mihanpour, H., Khashij, M., Shamsizadeh, Z., Gholami, M., Ebrahimi, A., Hassan Rezaeipandari, H., Roya Malekhamadi, R., Arsham, A., Parizan, F., & Jafari, V. (2020). Assessment of environmental literacy: a case study of Yazd citizens' awareness, attitudes, and practices in 2017. *Journal of Community Health Research*, 9(3), 149-158.
40. Mondal, S. (2025). The Study on Postgraduate Student's Cognitive Test Anxiety (CTA) at Sidho-Kanho-Birsha University in Purulia, West Bengal. *The Social Science Review A Multidisciplinary Journal*, 3(2), 57-64. <https://doi.org/10.70096/tssr.250302010>
41. Mandal, A., & Mondal, S. (2026). Social Media Addiction and its Relationship with Positive Mental Health among Undergraduate Students. *The Social Science Review A Multidisciplinary Journal*, 4(5), 162-170. <https://doi.org/10.70096/tssr.260405025>
42. Negev, M., Sagy, G., Garb, Y., Salzberg, A., & Tal, A. (2008). Evaluating the Environmental Literacy of Israeli Elementary and High School Students. *The journal of environmental education*, 39(2), 1-20.
43. Nugraha, L., Saud, S.U., Hartati, T., Damaianti, S.V. (2022). Profile of Learning Environmental Literacy in Elementary School. *Journal of Elementary Education*, 6(2), 211-222.
44. Nuneza, M. A., & Cloresb, M. (2017). Environmental literacy of k–10 student completers. *international journal of environmental & science education*, 12(5), 1195-1215.
45. Olson, R., & Rothkrug, P. (1991). *Mending the earth: a world for our grandchildren*. 2800 Woolsey Street, Berkeley, CA: North Atlantic Books. 94705.
46. Ors, M. (2022). A measurement of the environmental literacy of nursing students for a sustainable environment. *Sustainability*, 14(17), 11003.
47. Ozgurler, S., & Cansaran, A. (2014). Graduate Students, Study of Environmental Literacy and Sustainable Development. *International Electronic Journal of Environmental Education*, 4(2), 71-83.
48. Patra, B., & Mahato, S. (2025). Mobile Phone Problematic Use Among Postgraduate Students in Purulia: A Confirmatory Factor Analysis Study. *The Social Science Review A Multidisciplinary Journal*, 3(3), 294–304. <https://doi.org/10.70096/tssr.250303047>
49. Pujiati, A., Setiaji, K., & Oktavilia, S. (2020). Impact of Social Influence and Environmental Literacy on Green Consumption Behaviour a case study of Indonesian students. *International Journal of Advanced Science and Technology*, 29(6), 6510 – 6515.
50. Roy, C., & Mahato, S. (2025). Mobile Phone Problematic Use among Postgraduate Students in Purulia District of West Bengal: A Descriptive Study. *The Social Science Review A Multidisciplinary Journal*, 3(3), 249-260. <https://doi.org/10.70096/tssr.250303040>
51. Sakshi, Gupta, S. (2018). Effect of Environmental Education for Sustainable Development on the development of Environmental Awareness among Secondary School Students. *International Journal of Research in Social Sciences*, 8(3). 920-931.

52. Saribas, D., Teksoz, G., & Ertepinar, H. (2014). The Relationship between Environmental Literacy and Self-efficacy Beliefs toward Environmental Education. *Procedia - Social and Behavioural Sciences*, 116, 3664–3668.
53. Saha, B. (2012a). A Comparative Study of Environmental Awareness among Teacher Trainees of West Bengal. *Indian Streams Research Journal*, 2(9), 1-5.
54. Saha, B. (2012b). Creativity in relation to environmental awareness in Birbhum District: an analytical study. *International Journal of Scientific Research*, 2(8), 106–107. <https://doi.org/10.15373/22778179/aug2013/34>
55. Saha, B., Maji, S., & Saha, C. (2012). A Comparative Study of Gender in Regard to SES, Environmental Awareness and Creativity in Birbhum District. *Golden Research Thoughts*, 2(6), 1-3.
56. Saha, B., & Maji, S. (2013). Building the Sustainable Development Through Environmental Education: A Conceptual Study. *Review of Research*, 2(4), 1-3.
57. Savitri, N. E., Sudarmin, M., Murbangun., Nuswowati, M., & Saptono, S. (2025). Identification of Sustainable Environmental Literacy Needs as A Basis for Developing SDGs-Based Instruments. *Unnes Science Education Journal*, 14 (2), 417-426.
58. Shamuganathan, S., & Karpudewan, M. (2015). Modeling environmental literacy of Malaysian Preuniversity Students. *International Journal of Environmental & Science Education*, 10(5), 757–771.
59. Singleton, J. (2017). Environmental literacy and sustainability values: A content analysis of environmental education standards. *Eco-thinking*, 1, 1-18.
60. Stevenson, R. B. (2007). *Schooling and environmental education: Contradictions*. Routledge, London.
61. Szczytko, R., Stevenson, K., Peterson, M. N., Nietfeld, J., & Strnad, R. L. (2018). Development and validation of the environmental literacy instrument for adolescents. *Environmental Education Research*, 25(2), 193–210.
62. Tomas, M. R. V., Vicente, J. S. Y., De La Cruz, M. D. B., & Acha, D. M. H. (2022). Environmental Literacy and its impact on sustainable pedagogical behaviours of basic education Teachers, Lima-Peru. *Wseas Transactions on Environment and Development*, 18, 856–864.
63. Tuncer, G., Tekkaya, C., Sungur, S., Cakiroglu, J., Ertepinar, H., & Kaplowitz, M. (2009). Assessing pre-service teachers' environmental literacy in Turkey as a mean to develop teacher education programs. *International Journal of Educational Development*, 29(4), 426–436.
64. Veisi, H., Lacy, M., Mafakheri, S., & Razaghi, F. (2018). Assessing environmental literacy of university students: A case study of Shahid Beheshti University in Iran. *Applied Environmental Education & Communication*, 18(1), 25–42.
65. Volkmann, L., & Fraunhofer, H. (2023). Environmental literacy, sustainable education and post humanist pedagogy: teaching the climate crisis in a global, transatlantic online setting. *International Journal of Development Education and Global Learning*, 15(2), 87-102.
66. Wilke, R., Hungerford, H., Volk, T., & Bluhm, W. (1995). *Middle School Environmental Literacy Instrument*. Unpublished instrument.
67. Wilujeng, I., Dwandaru, W. S. B., & Rauf, R. a. B. A. (2019). The Effectiveness of Education for Environmentally Sustainable Development to Enhance Environmental Literacy in Science Education: A Case Study of Hydropower. *Journal Pendidikan IPA Indonesia*, 8(4). 521-528.
68. Wong, A. C., Afandi, H. S., Ramachandran, S., Kunasekaran, P., & Lian Chan, K. J. (2018). Conceptualizing environmental literacy and factors affecting pro-environmental Behaviour. *International Journal of Business and Society*, 19(S1), 128-139.

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