

OUTDOOR ENVIRONMENTAL EDUCATION: AN EFFECTIVE APPROACH TO ENVIRONMENTAL EDUCATION

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Abstract

Outdoor environmental education is a compelling and effective approach to fostering environmental awareness and sensitivity. This paper explores the effectiveness of outdoor environmental education in enhancing environmental knowledge, attitudes, and behaviors. The outdoor environmental programs have short-term and long-term positive impacts on learners' attitudes toward the environment. These programs, often based on hands-on experiences in natural settings, offer opportunities for learners to engage with the environment directly, leading to a deeper understanding of ecological concepts and an increased sense of responsibility toward conservation. Outdoor environmental education offers opportunities for learners to develop critical thinking, problem-solving, and decision-making skills necessary to address environmental challenges. The study also highlighted the different approaches aimed at engaging learners with nature thereby promoting experiential learning and fostering pro-environmental behaviors. The paper underscores the importance of integrating outdoor environmental education into educational curricula to empower learners to address environmental challenges effectively and to make informed decisions and take actions towards environmental sustainability.

Keywords: Outdoor Environmental Education, Environmental Education, Environmental Awareness, Pro-Environmental Behaviour

Introduction

The world economic and technology development have grown rapidly contributing serious impact on the environment and its inhabitants. This is evidenced in the changes in the climate, pollution, extinction of flora and fauna species, rising of seas levels, health decline and resource reduction (Ezeonu, Tagbo, Anike, Oje & Onwurah, 2012). Given the rapid urbanization, disconnection from the natural world and limited understanding of natural processes is becoming a global concern. Environmental challenges, such as climate change, habitat loss, pollution, and resource depletion are being witnessed. It is becoming increasingly clear that these challenges can only be addressed through a concerted effort to educate and inspire citizens about the importance of the environment and the need to protect it. Recently, these effects are noticeable, and it motivates the world to find a solution to these impacts. A major solution is educating people about the environment through Environmental Education (EE) (Gülersoy, Dulger, Dursun, Ay & Duyal, 2020).

The organized efforts to teach about how natural environments function and particularly how human beings can manage their behavior and ecosystems in order to live sustainably refer to EE. According to Erhabor & Don, (2016), EE is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges and fosters attitude, motivations and commitments to make informed decisions and take responsible action towards the environment

(Kaya, Gul & Gul, 2012). Environmental Education is defined as a scientific study of the natural world and how the natural world functions, with the intent of improving the relationships between man and the environment and providing the knowledge of and the ability to solve problems in the environment. It is an approach intended to assist students to live in harmony with nature and to promote a conservation consciousness focused on long-term and sustainable management of the natural environment.

Environmental Education has been a major vehicle for changing the attitudes, behaviour, developing awareness and sensitivity about major problems of the environment (Pzmony, 2011). Its main objective is to make pupils educated with respect to various aspects, dimensions or components of the environment, the relationship of man and environment, the impact of man's activities on the environment and the influence of the environment on man; to develop pupils understanding with respect to various issues and problems relating to environment and how to resolve them; to empower the pupils with such skills and competencies that would prove helpful in realizing the objective of sustainable development; to infuse in pupils the concern, urge and spirit of active participation in the activities that facilitate sustainable development, and also to inculcate such attitude and positive etiquettes that would promote a healthy, harmonious and enriched relationship with environment (Kimaryo, 2011). Environmental Education is essentially a practical process for equipping students with the knowledge of and about the environment which will result in right attitude in order to protect or improve the quality of their environment. Environmental education is a lifelong learning process that fosters a continual examination of environmental knowledge, skills, values, and world views. It often helps individuals and communities to become more aware of and concerned for their environment, both locally and globally. Outdoor environmental education is a key component of this process.

Despite the objectives and importance of Environmental Education, yet the attitudes of the people and practices on the environment is not something to be proud of. It is still at a low level and need serious attention from all parties (Abdullah, Zakaria & Razman, 2018). The unfriendly practices include indiscriminate burning of bushes, indiscriminate dumping of refuse, littering, and stockpiling of waste among others. Therefore, to ensure the issues and problems of the environment can be handled wisely and to increase knowledge, awareness and positive attitudes towards the environment, an effective method to teach EE should be implemented. One best way to achieve this is through Outdoor Environmental Education (OEE). This is so as outdoor EE is self-learning education and learning through experience (Reese, 2019). Outdoor environmental education is usually seen as a subset of environmental education or as a combination of outdoor and environmental education, encompassing learning activities occurring outdoors (Abdullah, 2017).

Outdoor environmental education is an approach of educating learners about the environment. Outdoor environmental education is often referred to as outdoor environmental learning and it is an example of experiential learning. The key areas of OEE are awareness, knowledge, attitude, skills, and participation (Hradsky, 2021). Outdoor environmental education is a powerful tool for connecting students with the natural world and fostering a sense of care and appreciation for the environment (Sawitri, 2017). Outdoor environmental education is a valuable means by which to encourage people to act in an informed manner on environmental issues. Hence, Outdoor environmental education is a substantial and engaging way to address a range of current environmental issues, including conservation and biodiversity, energy use and climate change as well as sustainable living. Outdoor environmental experiences provoke significant changes in the pro-environmental knowledge, attitudes and behavior of students.

Outdoor Environmental Education can be referred to as a teaching and learning process that builds on cognitive, affective, and whole personality through the learners' full contact with the environment. OEE is geared towards building a well-informed, empathetic, and prudent society through the process of exploring the world in an all-embracing and all-inclusive manner (Dillon, Rickinson & Teamey, 2016). Outdoor Environmental Education has a holistic aim of personal and interpersonal development involving learning about nature, the environment, oneself, and others. It is not an end but is part of the means to help learners internalize values and develop skills and stances that will allow them to understand and live in harmony with their environment. Outdoor environmental education is the organized effort of learning or studying biotic and abiotic aspects of the environment in an outdoor setting that is free of anthropogenic impacts (Fang, Eg & Chang, 2017). Outdoor environmental education involves the teaching process of natural experiences through direct experience with the aim of meeting the learning goals of students (Öhman & Sandell, 2016).

Goals of Outdoor Environmental Education

Outdoor environmental education is designed to help students gain an appreciation and understanding of the environment and its complexities. There are many goals associated with outdoor environmental education programs (Asmara, Anwar & Muhammad, 2016). Firstly, outdoor environmental education aims to foster an awareness and appreciation of the environment. The awareness and appreciation of the environment can be achieved by encouraging students to engage with the natural world which provides opportunities for students to learn about different ecosystems and habitats. Students see the impacts of human activity on the environment and also witness how diverse and fragile the environments are by learning outdoors. This is in line with the goal of fostering environmental awareness, which is defined as the "understanding that complex factors influence the environment and that individual and societies are interrelated with the natural world" (Kanene, 2016). Another long-term goal of outdoor environmental education is promoting environmental cognitive development. This refers to the use of intellectual skills and abilities, such as thinking and reasoning. According to Palmer (1998), learning about the environment outside the classroom helps to improve concentration, develop creativity and problem-solving, and promote a sense of wonder.

Benefits of Outdoor Environmental Education

Outdoor environmental education provides numerous benefits for students. Outdoor environmental education plays a crucial role in shaping environmentally responsible and conscious individuals who are equipped with the knowledge and skills to protect and preserve the environment for future generations. The importance of outdoor environmental education lies in its ability to foster a sense of wonder and curiosity about the environment. It allows learners to appreciate the beauty of the natural world and to understand that humans are just one part of a complex web of life (Kulas, 2019). Outdoor environmental education encourages learners to learn more about the environment and to engage in activities that have a positive impact on the natural world. OEE helps to develop students' sense of environmental awareness by exposing them to the beauty and the issues of the natural world.

Outdoor environmental education actively promotes pro-environmental and sustainable behaviors by encouraging students to role model how they should be protecting the environment. It also acts as a platform for cultural and academic growth, helping students to develop as open-minded and well-informed members of society (Mikaels, Backman &

Lundwall, 2016). Outdoor environmental education gives support to the idea that learning happens best when it is applied to real-life situations. Therefore, academic learning is brought to life and given real relevance and value by taking a hands-on approach and immersing students in their topics of study. This, in turn, nurtures a love of learning and sparks the development of key attributes such as critical thinking, problem-solving, curiosity, and creativity (Andre, Williams, Schwarta & Bullard, 2017). Outdoor environmental education promotes a sense of personal and social development, by fostering an understanding and appreciation for the environment in which people live and work. It builds on a whole set of life skills and encourages self-confidence and leadership development. Outdoor environmental education presents a lot of experiences and experiences make it possible that a student may develop a passion for an activity which could later become a lifelong hobby or even a future career.

The outdoor environmental education program builds on community and cultural values, without raises expectations and standards (Bowdridge & Blenkinsop, 2011), strengthens connections between students, and develops positive associations around school activities and the outdoors. Students have learning experiences that are far different from that experienced inside a building while using the outdoor environmental environment. These natural connections have also offset the negative effects of urbanization (Kellert, 2012). Outdoor environmental education can be said to induce students' learning motivation and enthusiasm, create a more relaxed learning environment, and help students to learn at their own speed and terms, which is believed to be more effective (Gilbertson, Ewert, Siklander & Bateset, 2022). Outdoor education is remarkable and a highly effective place for learning. Outdoor environmental education provides learners with the opportunity to experience and learn about nature while improving their view on the functional values provided by the environment and to build appropriate outdoor learning knowledge, skills, attitudes, and motivations that further support environmental stewardship and sustainability (Ohman & Sandell, 2016).

Through Outdoor environmental education, learners directly experience nature and the concepts being presented in a natural setting that are complex. Materials or concepts learned outside of the classroom have higher retention rates among students and in many cases may generate a new set of probing questions (Bell & Chang, 2017). Therefore, outdoor environmental teaching facilitates learning about environmental awareness and stimulates students' curiosity, emotions, and consciousness. During outdoor environmental experiences, students become interested in elements of the environment that they are concerned about, investigate the cause of the problem, and start thinking, planning, designing, interviewing, and conducting research sampling in the field, and then return to the classroom to reflect, discuss, and explore new problems.

Cognitive control skills important for environmental decision-making and problem-solving, learner social skills, including teamwork, sharing, the ability to build and repair relationships and letting learners become informed and involved citizens are promoted and developed through OEE. Outdoor environmental education activities are carried out in order to gain environmental knowledge and increase environmental awareness. Properly planned outdoor environmental education encourages students to develop an appreciation and understanding of natural and cultural sites, objects, heritage, and human and non-human interactions. This understanding forms the essential part of fostering a commitment to conserving that understanding for the future. When outdoor environmental education works

well, it nurtures the likelihood of environmental ethics growing into a life of significant pro-environmental behavior (Freeman & Seaman, 2020).

Outdoor environmental education is uniquely placed to deliver effective learning for sustainable development, as it often seeks to promote a holistic and interdisciplinary understanding of environmental issues and foster a personal sense of environmental and social responsibility. By facilitating a better understanding of the interconnected nature of environmental problems and exploring the potential range of solutions, outdoor environmental education has the potential to equip learners of all ages with the knowledge, skills, and motivation needed to make a positive contribution to society and the environment (Dillion, Rickinson & Teamey, 2016). Through Outdoor environmental education, students are provided with an immersive and active learning experience in the natural environment which enhances understanding of the natural world and foster a sense of responsibility to act for the long-term benefit of the environment. It provides opportunities for hands-on learning, exploration, and discovery in a real-world context. Through outdoor environmental education, students can learn about ecological concepts, biodiversity, environmental conservation and environmental sustainable practices. Additionally, outdoor environmental education offers numerous benefits for students' physical and mental well-being. By being in nature, students can experience the positive effects of fresh air, sunlight, and physical activity (Kellert, 2012). Students can also develop a sense of calmness and connection to the natural world, which can reduce stress and improve overall mental health.

Approaches to Outdoor Environmental Education

Outdoor environmental education encompasses various methods and approaches aimed at engaging learners with nature, promoting experiential learning and fostering environmental awareness. The key methods and approaches of OEE include:

1. **Experiential Learning:** Outdoor environmental education emphasizes in natural settings hands-on experiences in natural settings allowing learners to interact directly and actively with the environment in order to facilitate learning (Buriss & Buriss, 2011).
2. **Outdoor Learning Method:** Outdoor learning is an effective method employed by teachers to introduce students to their environment. It involves engaging students in outdoor activities to enhance their understanding of the surroundings. This approach involves outdoor environmental activities focused on environmental exploration, conservation and sustainability. This approach helps connect them with the natural environment while reinforcing environmental concepts (Kulas, 2019).
3. **Holistic Approach:** Outdoor environmental education takes a holistic approach, aiming to promote personal, social, and environmental growth through experiential learning by integrating various aspects of learning and development. Outdoor environmental education is considered a holistic approach that encompasses earth education, bio-regional education, expedition learning, expansion training, ecological education, and natural experiences (Harper, 2017).
4. **Dynamic Teaching Approach:** Adopting a dynamic teaching approach is recommended for outdoor environmental teaching. This involves embracing unpredictability, setting boundaries and expectations, and incorporating dynamism into the teaching process (Asmara, Anwar & Muhammed, 2016). This approach encourages flexibility and adaptability in outdoor environmental education, allowing educators to tailor learning experiences and activities to the environment and learners.

5. **Ecological Education:** This approach focuses on understanding ecosystems, biodiversity, interdependence of living organisms, environmental interconnections and ecological principles through outdoor environmental experiences.
6. **Field Trips and Expeditions:** Taking students outdoors for field trips allows them to explore natural environments firsthand and observe ecological principles in action (Behrendt & Franklin, 2014). Through this approach, students observe, study and appreciate nature.
7. **Place –Based Education:** This approach focuses on using local environments, culture, and communities to foster connections between learner and their surroundings. The purpose of this approach is for learning, encouraging students to connect with and care for their surroundings (Aarts, Wendel-Vos, Van Oers, Van de Goor & Schuit, 2010).
8. **Project-Based Learning:** this approach engages students in hands-on projects related to environmental issues, encouraging critical thinking and problem-solving skills (Freeman & Seaman, 2020). Students undertake projects that require them to investigate, analyze, and address environmental issues in real-world settings.
9. **Reflection and Discussion:** Facilitating reflection and group discussions helps students process their outdoor environmental experiences, deepen their understanding, and develop critical thinking skills.
10. **Theoretical Approaches:** Theoretical approaches to outdoor environmental learning involve activities that contribute to environmental education, personal, and social development. It emphasizes the integration of environmental education into experiential learning (Gilbertson, Ewert, Siklander & Bateset, 2022)

These diverse approaches could be employed in outdoor environmental education to enhance the learning experience, instill a sense of responsibility for the environment, promote a deeper connection with the environment and promote sustainable behaviors.

Challenges to Outdoor Environmental Education

Outdoor environmental education comes with its share of both perceived and real challenges. These challenges are barriers to using outdoor education effectively by educators. Educating students effectively requires time, planning, and a great deal of work on the part of the educator. With so many standards to address, the emphasis on state testing, and a general lack of preparation time, teachers often fail to incorporate outdoor education into their curriculum because it is seen as unnecessary (Knapp, 2020). Furthermore, Powers (2004) found that most schools are focused on literacy and math, while science and social studies are far down the list of priorities. This tight focus on math, reading, and writing standards account for teachers have such little time to teach environmental issues or go outdoors for lessons, but does not account for why science is ignored while it also has state-mandated standards that need to be met. Evans, Whitehouse and Gooch (2012) found that teachers felt a need to have more time to innovate to properly implement outdoor environmental education.

Another most commonly cited barrier to outdoor education is limited funding to pay for curriculum development and transportation. (Hradsky, 2021). Funding is even cited as the second biggest barrier among teachers who consider themselves to be environmental-based educators (Ernst, 2014). Furthermore, the lack of nearby green spaces falls under funding because making use of outdoor spaces requires the use of transportation for many schools. Transportation of students can become costly as many schools do not budget for outdoor environmental education costs and grants can be very difficult to come by (Evans et al, 2012). Reese (2018) found out that the cost of transporting learners or collecting money to travel to an outdoor location was a significant barrier to using outdoor environmental experiences in their school.

Another barrier is safety hazards. Fear and concerns about safety and perceived risks may deter educators from implementing outdoor environmental activities. Teachers worry about taking large classes to areas with water or ponds, losing a student, or coming into contact with poisonous plants or animals. Parents on the other hand also worry about safety of the learners. Poor students' behavior and attitudes could be a barrier to outdoor environmental education. Upon arrival at an outdoor environmental location, most students are often disoriented resulting in excited, explorative, and unrestrained behavior. This could hinder an effective outdoor environmental education. Again, lack of venue options could hinder an effective outdoor environmental education in the sense educators might find it difficult in finding a good location for the learners that is a location that would bring out the lesson the educator wants to inculcate in the learners. Furthermore, most environmental educators are not trained in outdoor environmental education and therefore do not have the experience. Consequently, they will not advocate for OEE.

Addressing these challenges requires collaborative endeavors, including obtaining adequate funding, creating efficient logistical arrangements, advocating for institutional support, and establishing precise guidelines and protocols to ensure smooth and successful field trip experiences in teacher education programs (Sjoblom, Eklund & Fagerlund, 2023). Also, there should be training and retraining of environmental education educators.

Conclusion

Environmental Education can be effectively implemented through outdoor environmental education. Environmental educators must adopt some approaches in outdoor environmental education to enhance the learning experience, instill a sense of responsibility for the environment, promote a deeper connection with the environment and promote sustainable pro-environmental behaviors. Outdoor environmental education come with its challenges therefore addressing these challenges requires collaborative endeavors, including obtaining adequate funding, creating efficient logistical arrangements, advocating for institutional support, and establishing precise guidelines and protocols to ensure smooth and successful field trip experiences in teacher education programs.

References

- Aarts, M. J., Wendel-Vos W., Van Oers, H A, Van de Goor, I. A. & Schuit, A. J. (2010). Environmental determinants of outdoor play in children: a large-scale cross-sectional study. *American Journal of Preventive Medicine*, 39 (3):212–219.
- Abdullah, A., Zakaria, S. Z. S. & Razman, M. R. (2018). Environmental Education through Outdoor Education for Primary School Children. *International Journal of the Malay World and Civilization*, 6 (1), 27 - 34 (<https://doi.org/10.17576/jatma-2018-06SI1-05>)
- Abdullah, S. I. S. S. (2017). An Investigation into the Influence of Outdoor Environmental Education Courses on the Environmental Attitude and Behaviors of Malaysian Participants: A Life History Approach. The University of Edinburgh.
- Andre, E. K., Williams, N., Schwartz, F. & Bullard. C. (2017). Benefits of campus outdoor recreation programs: a review of the literature. *Journal of Outdoor Recreation, Education and Leadership* 9 (1):15–25

- Asmara, C. H., Anwar, K. & Muhammad, R. N (2016). EFL learners' perception toward an outdoor learning program. *International Journal of Education and Literacy Studies*, 4 (2),74–81.
- Behrendt, M. & Franklin, T. (2014). A Review of Research on School Field Trips and Their Value in Education. *International Journal of Environmental & Science Education*, 9, 235-245
- Bell, B. J. & Chang, H. (2017). Outdoor orientation programs: a critical review of program impacts on retention and graduation. *Journal of Outdoor Recreation, Education and Leadership*, 9 (1):56–68
- Bowdridge M, Blenkinsop S (2011) Michel Foucault goes outside: discipline and control in the practice of outdoor education. *Journal of Experimental Education*, 34(2):149–163
- Burriss, K. & Burriss, L. (2011). Outdoor play and learning: Policy and practice. *International Journal of Education Policy and Leadership*, 6 (8), 1-12.
- Dillon, J., Rickinson, M. & Teamey, K. (2016). The value of outdoor learning: evidence from research in the UK and elsewhere. In: Towards a convergence between science and environmental education. Routledge, Oxfordshire, pp 193–200
- Erhabor, N. I & Don, J. U. (2016). Impact of Environmental Education on the knowledge and attitude of students towards the environment. *International Journal of Environmental & Science Education*, 11, (12), 5367-5375.
- Ernst, J. (2014). Early childhood educators' use of natural outdoor settings as learning environments: An exploratory study of beliefs, practices, and barriers. *Environmental Education Research*, 20(6), 735–752. <https://doi.org/10.1080/13504622.2013.833596>
- Evans, N., Whitehouse, H., & Gooch, M. (2012). Barriers, successes and enabling practices of education for sustainability in far North Queensland schools: A case study. *The Journal of Environmental Education*, 43(2), 121–138. <https://doi.org/10.1080/00958964.2011.621995>
- Ezeonu, C. S., Tagbo, R., Anike, E. N., Oje, O. A., & Onwurah, I. N. E. (2012). Biotechnological tools for environmental sustainability: Prospects and challenges for environments in Nigeria-A standard review. *Biotechnology Research International*, 1-26.
- Fang, W. T., Eg, E. & Chang, M. C. (2017). Physical outdoor activity versus indoor activity: their influence on environmental behaviors. *International Journal of Environmental Research and Public Health*, 14 (7):797. <https://doi.org/10.3390/ijerph14070797>.
- Freeman, M. & Seaman, J. (2020) Outdoor education in historical perspective. *History of Education Review*, 49 (1):1–7.
- Gilbertson, K, Ewert, A., Siklander, P. & Bateset, T. (2022) Outdoor education: methods and strategies, 2nd edn. Human Kinetics, Champaign, IL.

- Gülersoy, A. E., Dülger, İ., Dursun, E., Ay, D., & Duyal, D. (2020). What kind of environmental education? Some suggestions in the context of contemporary approaches. *Electronic Turkish Studies*, 15(5), 2357-2395. <https://dx.doi.org/10.7827/TurkishStudies.44074>.
- Harper, N. J (2017). Outdoor risky play and healthy child development in the shadow of the “risk society”: a forest and nature school perspective. *Child and Youth Services*, 38 (4):318– 334.
- Hradsky, J. (2021), "Implementing Outdoor Education Curriculum: The Benefits Of, Barriers To, And Materials Required For Successful Outdoor Education". *School of Education and Leadership Student Capstone Projects*. 627.1-62. https://digitalcommons.hamline.edu/hse_cp/627
- Kanene, K. M. (2016).The impact of Environmental Education on the environmental perceptions/attitudes of students in selected secondary schools of Botswana. *European Journal of Alternative Education Studies*,1 (2), 36-54.
- Kaya, H. E., Gul, H., & Gul, S. S. (2012). Impact of Environmental Education on elementary school students in Turkey. *International Journal of Multidisciplinary Thought*, 2(3), 423- 431.
- Kellert, S. R (2012) Building for life: designing and understanding the human-nature connection. Island press, Washington, DC
- Kimaryo, L. A. (2011). Integrating environmental education in primary school education in Tanzania and teachers’ perception and teaching practice. Abo Akademi University Press.
- Knapp, C. E. (2020). Outdoor and Environmental Education - Defining Terms, Objectives and Purposes, Instructional Methods, History and Status in the United States and Abroad. Retrieved June 30, 2024, from <https://education.stateuniversity.com/pages/2305/Outdoor-Environmental-Education.html>
- Kulas, K. A (2019) Developing An outdoor mindful activity-based curriculum for English language learners. In: *School of Education and Leadership Student Capstone Projects*, 285. https://digitalcommons.hamline.edu/hse_cp/285
- McKeown-Ice, R. (2000). Environmental education in the United States: A survey of preservice teacher education programs. *The Journal of Environmental Education*, 32, 4–11. <https://doi.org/10.1080/00958960009598666>
- Mikaels, J., Backman, E. & Lundvall, S. (2016). In and out of place: exploring the discursive effects of teachers’ talk about outdoor education in secondary schools in New Zealand. *Journal of Adventure Education and Outdoor Learning*, 16 (2):91–104
- Öhman, J. & Sandell, K. (2016). Environmental concerns and outdoor studies. Routledge, Oxfordshire
- Palmer, J. A. (1998). Environmental education in the 21st century: Theory, practice, progress, and promise. New York: Routledge.

- Powers, A. L. (2004). Teacher preparation for environmental education: Faculty perspectives on the infusion of environmental education into Preservice methods courses. *The Journal of Environmental Education*, 35(3), 3–11. <https://psycnet.apa.org/doi/10.3200/JOEE.35.4.17-32>
- Pzmony, (2011). Endangerment and cause or contribute findings for greenhouse gases under section 202(a) of the clean air act, EPA response to public comments. U.S. *Environmental Protection Agency*.
- Reese, R. F. (2018). A qualitative exploration of the barriers and bridges to accessing community-based K-12 outdoor environmental education programming. *Journal of Outdoor and Environmental Education*, 22 (1), 21–37. <https://doi.org/10.1007/s42322-018-0019-4>
- Sawitri, D. R. (2017). Early childhood environmental education in tropical and coastal areas: A meta-analysis. In IOP Conference Series: Earth and Environmental Science (pp. 55), IOPscience.
- Sjoblom. P., Eklund, G., & Fagerlund, P. (2023). Student teachers view on outdoor education as teaching method-two cases from Finland and Norway. *Journal of Adventure Education and Outdoor Learning*, 23 (3), 286-300.