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**An Annotated Bibliography of Research Relevant to
Environmental Education**

2014-2015

The Humane Society Institute for Science and Policy

**Compiled by Erich Yahner
(All Abstracts and Summaries from Authors or Publishers)**

JOURNAL ARTICLES

Ayeni, M. A. (2014). Environmental education and social ethics. *Environmental Education*, 5(3).

The interdependence of man and the environment in its holistic form needs a better understanding. This is necessary for the protection and improvement of the environment and the survival of man. There is undoubtedly a balanced relationship between man and the environment, this has to be maintained. For a long time, man cherished the concept that he was the master of the environment. This has been the most erroneous and damaging concept developed in respect to man-environment relationship. Environmental education is a necessary tool for taking appropriate decisions concerning the solution and prevention of environmental problems which are considered disequilibrium caused by certain factors in the established relationship between man, animals, plants and others. For a very long time, man's activities on the environment have become more pronounced in different spheres, culminating in serious environmental problems. Man therefore needs to be educated for the understanding, solution and prevention of these problems. This paper examines the need for environmental education and social ethics for the survival of man and understanding and improvement of the environment.

Chen, J. C., & Martin, A. R. (2015). Role-play simulations as a transformative methodology in environmental education. *Journal of Transformative Education*, 13(1), 85-102.

Knowledge-based environmental education has been consistently found to be limited in its effectiveness due to its small and indirect role in promoting sustainable behavior, while focusing on the impact of social context has been found to be more conceptually relevant. Transformative learning theory is positioned to be foundational to environmental education based on its increasing focus on promoting social activism through personal transformations. We suggest four criteria in the development of an effective transformative environmental education methodology. Methodologies should (1) focus on change and not just knowledge attainment, (2) reveal behaviors in a real-world context, (3) highlight internal and external influences on environmental behavior, and (4) include a problem-solving approach that demands a solution. Role-play simulations addresses these criteria and can influence the perspective change necessary to promote sustainable behavior. We provide one example of this methodology and discuss its potential merits in fostering transformative learning in adult environmental education.

Cole, L. B. (2014). The Teaching Green School Building: a framework for linking architecture and environmental education. *Environmental Education Research*, 20(6), 836-857.

The 'Teaching Green School Building' is an emergent type of school building that attempts to engage building users with environmental issues in buildings. Architectural interventions in these buildings range from signage to interactive touch screens to gardens and demonstration kitchens that foster educational programmes about sustainable food. The result can be a building that offers informal education, support for formal environmental education, and, overall, a chance for students to embody sustainable living in their daily lives at school. To date, this type of building has been weakly theorized, and the relationship between architectural interventions and environmental education largely unexplored in the literature. This literature review weaves together theories that

connect the physical environment with human factors. In particular, research in environmental education, museum studies, conservation psychology and architecture illuminates ways in which buildings can support environmental education and with tactics that go well beyond the convention of informational signage on the wall. The result of the literature review is a framework that points to design patterns that extend from passive to active, individual to collective, and formal to informal. This framework can inform the design, use and evaluation of school buildings designed with pedagogical intent.

Drissner, J. R., Haase, H. M., Wittig, S., & Hille, K. (2014). Short-term environmental education: long-term effectiveness?. *Journal of Biological Education, 48*(1), 9-15.

The 'Green Classroom' in the Botanical Garden of the University of Ulm is a learning forum outdoor school that is used by about 2500 school students annually. Its educational concept is based on experiential learning and is geared towards expanding students' biological knowledge and developing positive attitudes towards small animals and invertebrates such as insects. In the first study, 104 secondary-school students (49 who had previously visited the 'Green Classroom') were asked to write an essay about small animals such as insects. Students who had visited the 'Green Classroom' before showed more biological understanding and portrayed more positive emotions towards small animals, and had fewer misconceptions than their peers. In the second study, 121 students (grades 3 and 4) were asked to draw a picture of a forest as a habitat; 65 of these students had previously visited the 'Green Classroom' (test group). Students of the test group drew more smaller types of animals in their pictures and furthermore more different species than the control group.

Flowers, A. A., Carroll, J. P., Green, G. T., & Larson, L. R. (2015). Using art to assess environmental education outcomes. *Environmental Education Research, 21*(6), 846-864.

Construction of developmentally appropriate tools for assessing the environmental attitudes and awareness of young learners has proven to be challenging. Art-based assessments that encourage creativity and accommodate different modes of expression may be a particularly useful complement to conventional tools (e.g. surveys), but their efficacy and feasibility across diverse contexts has not been adequately explored. To examine the potential utility of integrating art into evaluations of environmental education outcomes, we adapted an existing drawing prompt and corresponding grading rubric to assess the environmental attitudes and awareness of children (ages 6-12) at summer camps in Athens, GA USA (n = 285). We then compared children's drawings with scores on a more typical survey instrument that measured similar outcomes, the Children Environmental Perception's Scale. Results showed that a drawing prompt was a practical and unique learner-centered tool for measuring distinct components of environmental attitudes and awareness. Findings also revealed different response patterns across the two instruments, highlighting the value of using multiple approaches (e.g. art-based and survey-based) to assess cognitive and affective aspects of children's environmental orientations.

Frantz, C. M., & Mayer, F. S. (2014). The importance of connection to nature in assessing environmental education programs. *Studies in Educational Evaluation, 41*, 85-89.

Environmental education imparts knowledge and creates experience to change beliefs, attitudes – and most importantly – behavior. What are the deep motivators of human behavior? Theory and research suggest that feeling connected to someone or something motivates protective and self-sacrificing behavior. This paper reviews the large body of research demonstrating that connectedness to nature is an important predictor of environmentally responsible behavior. We review past research on self-reported behavior, then summarize new research from our lab that demonstrates a link between connectedness to nature and actual conservation behavior (electricity use). We conclude that promoting connectedness to nature should be a goal for environmental education programs, and should therefore be an important part of any assessment.

Fraser, J., Gupta, R., & Krasny, M. E. (2015). Practitioners' perspectives on the purpose of environmental education. *Environmental Education Research, 21*(5), 777-800.

Since the 1980s, scholars have suggested that environmental education (EE) has a 'definitional problem' represented by a multiplicity of perspectives that have critically impacted its discourse, practices, and outcomes.

This study sought to investigate how North American EE practitioners from backgrounds ranging from formal and non-formal institutions think about their work. We focused on folk narratives and emerging urban environmental concerns of community education rather than reliance on academic opinion alone. Using Q methodology, the study identified five distinct perspectives that appear to represent different ways of prioritizing EE outcomes. All five perspectives were concerned with promoting sustainable living and improved human well-being, but the nuances suggest that an individual who adheres strongly to one may feel someone holding a contrasting perspective is working at cross-purposes. The authors suggest that understanding these perspectives can help reduce misunderstanding within the EE field.

Genc, M. (2015). The project-based learning approach in environmental education. *International Research in Geographical & Environmental Education*, 24(2), 105-117.

The purpose of this study is to investigate the effect of project-based learning on students' attitudes toward the environment. In the study that was performed with 39 students who take the "Environmental Education" course, attitude changes toward the environment were investigated in students who developed projects on environmental problems. A mixed-method explanatory design was used to flesh out study results. After being informed about basic environmental concepts and project-based learning, students engaged themselves in group work to develop projects regarding environmental problems. The developed projects were presented with the aim of informing students. According to research results, although a significant gender difference in environmental attitudes was not found, project-based learning had a positive effect on students' environmental attitudes. Students defined project-based learning use in environmental education as an approach that is beneficial, enhancing creativity, encouraging research and providing permanent learning. Students believed this practice helped them define environmental problems more clearly and take on more active tasks in the solution process.

Iovan, M. (2015). The ethical and civic dimensions of environmental education. *Bulletin of the Transilvania University of Brasov. Series VII: Social Sciences. Law*, 8(1), 25-34.

The author proves that the efficacy of the environmental education could be much higher if it is included within the broader sphere of moral and civic education and if it is driven by a more extensive ideal sprung from the fundamental human right to a clean and well preserved environment, by the contemporary moral and civil values. Based on empirical research, the author pleads and motivates for an increased capitalization of the humanities and social sciences, of art, of environmental ethics and aesthetics in shaping "the ecological personality" of the tomorrow people. Seen as a result of the environmental education, the ecological personality materializes in volunteering in order to find the answers for the environmental issues in the contemporary societies. When shaping these personality traits through environmental education activities, one must emphasize the importance of practice and applied actions aimed to protect the environment, and in general, the practice of civic-moral education methods.

Kopnina, H. (2014). Future scenarios and environmental education. *Journal of Environmental Education*, 45(4), 217-231.

This article explores a number of questions about visions of the future and their implications for environmental education (EE). If the future were known, what kind of actions would be needed to maintain the positive aspects and reverse the negative ones? How could these actions be translated into the aims of EE? Three future scenarios are discussed: the limits to growth (the great tragedy and demise); sustainable development and ecological modernization (hope and innovation); and the Anthropocene park. These scenarios are linked to corresponding EE/ESD approaches and instrumentalism in education is argued as a morally justifiable goal. Finally, education for deep ecology is advocated in order to address the ethical implications of the last scenario.

Liefländer, A. K., & Bogner, F. X. (2014). The effects of children's age and sex on acquiring pro-environmental attitudes through environmental education. *Journal of Environmental Education*, 45(2), 105-117.

Environmental education programs aiming to enhance children's environmental attitudes in a pro-environmental direction require background information, such as age and sex differences, to ensure appropriate

design. We used the 2-MEV model with its domains preservation and utilization of nature to assess a four-day program at an educational field center with students 9–10 and 11–13 years of age. A pre- and post-retention test design revealed younger students to be more responsive concerning positive attitude shifts than older students, whereas the sexes were equally influenced. Program developers should consider that education has a stronger effect on young children's environmental attitudes.

McPhie, J., & Clarke, D. G. (2015). A walk in the park: Considering practice for outdoor environmental education through an immanent take on the material turn. *Journal of Environmental Education*, 46(4), 230-250.

This article considers practice for environmental education from the perspective of the material turn by taking the reader along on an outdoor learning session in a park. We present a fictional walk where we encounter plants, trees, wasp-orchids, stones, walking sticks, plastic bags, people, weather, and kites, each of which has a story to tell that demonstrates ontological immanence and the material process of being alive. These stories help suggest some practical ways in which environmental education can be reoriented from an essentialist paradigm to one of becoming, tackling prevailing conceptions of the human mind as disembodied from the world.

Roczen, N., Kaiser, F. G., Bogner, F. X., & Wilson, M. (2014). A competence model for environmental education. *Environment and Behavior*, 46(8), 972-992.

The goal of environmental education is ultimately to enable a person to strive for and to attain a more ecological way of life. In this article, we begin by distinguishing three forms of environmental knowledge and go on to predict that people's attitude toward nature represents the force that drives their ecological behavioral engagement. Based on data from 1,907 students, we calibrated previously established instruments to measure ecological behavior, environmental knowledge, and attitude toward nature with Rasch-type models. Using path modeling, we corroborated our theoretically anticipated competence structure. While environmental knowledge revealed a modest behavioral effect, attitude toward nature turned out to be, as expected, the stronger determinant of behavior. Overall, we propose a competence model that has the potential to guide us into more evidence-based ways of promoting the overall ecological engagement of individuals.

Stern, M. J., Powell, R. B., & Hill, D. (2014). Environmental education program evaluation in the new millennium: what do we measure and what have we learned?. *Environmental Education Research*, 20(5), 581-611.

We conducted a systematic literature review of peer-reviewed research studies published between 1999 and 2010 that empirically evaluated the outcomes of environmental education (EE) programs for youth (ages 18 and younger) in an attempt to address the following objectives: (1) to seek reported empirical evidence for what works (or does not) in EE programming and (2) to uncover lessons regarding promising approaches for future EE initiatives and their evaluation. While the review generally supports consensus-based best practices, such as those published in the North American Association for Environmental Education's *Guidelines for Excellence*, we also identified additional themes that may drive positive outcomes, including the provision of holistic experiences and the characteristics and delivery styles of environmental educators. Overall, the evidence in support of these themes contained in the 66 articles reviewed is mostly circumstantial. Few studies attempted to empirically isolate the characteristics of programs responsible for measured outcomes. We discuss general trends in research design and the associated implications for future research and EE programming.

Wals, A. E., Brody, M., Dillon, J., & Stevenson, R. B. (2014). Convergence between science and environmental education. *Science*, 344(6184), 583-584.

Urgent issues such as climate change, food scarcity, malnutrition, and loss of biodiversity are highly complex and contested in both science and society (1). To address them, environmental educators and science educators seek to engage people in what are commonly referred to as sustainability challenges. Regrettably, science education (SE), which focuses primarily on teaching knowledge and skills, and environmental education (EE), which also stresses the incorporation of values and changing behaviors, have become increasingly distant. The relationship between SE and EE has been characterized as "distant, competitive, predator-prey and host-

parasite" (2). We examine the potential for a convergence of EE and SE that might engage people in addressing fundamental socioecological challenges.

BOOKS

Cutter-Mackenzie, A., Edwards, S., Moore, D., & Boyd, W. (2014). *Young children's play and environmental education in early childhood education*. Springer Science & Business Media. ISBN: 9783319037394.

In an era in which environmental education has been described as one of the most pressing educational concerns of our time, further insights are needed to understand how best to approach the learning and teaching of environmental education in early childhood education. In this book we address this concern by identifying two principles for using play-based learning early childhood environmental education. The principles we identify are the result of research conducted with teachers and children using different types of play-based learning whilst engaged in environmental education. Such play-types connect with the historical use of play-based learning in early childhood education as a basis for pedagogy. In the book 'Beyond Quality in ECE and Care' authors Dahlberg, Moss and Pence implore readers to ask critical questions about commonly held images of how young children come to construct themselves within social institutions. In similar fashion, this little book problematizes the taken-for-grantedness of the childhood development project in service to the certain cultural narratives. Cutter-Mackenzie, Edwards, Moore and Boyd challenge traditional conceptions of play-based learning through the medium of environmental education. This book signals a turning point in social thought grounded in a relational view of (environmental) education as experiential, intergenerational, interspecies, embodied learning in the third space. As Barad says, such work is based in inter-actions that can account for the tangled spaces of agencies. Through the deceptive simplicity of children's play, the book stimulates deliberation of the real purposes of pedagogy and of schooling.

Stevenson, R. B. (2013). *International handbook of research on environmental education*. New York: Routledge. ISBN: 9780415892391.

The environment and contested notions of sustainability are increasingly topics of public interest, political debate, and legislation across the world. Environmental education journals now publish research from a wide variety of methodological traditions that show linkages between the environment, health, development, and education. This growth in scholarship makes this an opportune time to review and consolidate the knowledge base of the environmental education (EE) field. The purpose of this 51-chapter handbook is not only to illuminate the most important concepts, findings and theories that have been developed by EE research, but also to critically examine the historical progression of the field, its current debates and controversies, what is still missing from the EE research agenda, and where that agenda might be headed. Published for the American Educational Research Association (AERA).