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Environmental literacy and attitudes of self-efficacy in environmental education

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Abstract

Students' self-efficacy and environmental knowledge are linked in this study, which assesses the degree of literacy and self-efficacy among preservice primary teachers. According to the study's findings, their self-efficacy views were shown to be closely linked to their environmental concerns. "The study's findings demonstrate that participants lacked environmental knowledge and self-efficacy beliefs connected to environmental education, despite their strong environmental attitudes, concerns, and perceptions." Students in teacher training programs need to learn more about environmental issues.

Keywords: "Preservice primary teachers, environmental literacy, self-efficacy views, environmental education"

1. Introduction

Today, we are confronted with significant environmental issues such as global warming, ozone depletion (Maurer and Bogner, 2020), and species extinction, all of which endanger the viability of life. Education is our most effective line of protection against such dangers because environmental issues may have far-reaching ramifications for our future. "People who are aware and concerned about the environment and its associated challenges," "and who have knowledge skills attitudes motivations and commitments to work" together to address present problems as well as prevent new ones from forming are "the ultimate goal of environmental education" (Goldman et al., 2018).

"In recent years, environmental literacy has risen to the top of the environmental education" priority list. "It is the ability to recognize and analyze the health of environmental systems, as well as to take appropriate action to maintain, restore, or improve that system's health" that is defined as environmental literacy (Fauville et al., 2020). In the words of (Ardoin and Bowers 2020), "environmental literacy consists of environmental knowledge, environmental attitudes, perceptions of environmental action, and environmental caring." To gauge the environmental literacy of 700 aspiring teachers, researchers used an instrument to measure their attitudes and concerns about the environment. According to the research findings, environmental concern and perceptions of environmental behavior are linked to environmental awareness. According to their results, there is an apparent correlation between environmental viewpoints and environmental attitudes. They also found minor but substantial links between people's views and their worries and between their fears and how they behave.

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Another study (Granziera and Perera, 2019) discovered that primary pupils' environmental practices were unrelated to their understanding of environmental concerns. For example, emotional connection and sensitivity to nature, “traits that may have influenced their environmental literacy,” seemed to have a more significant effect on their behaviors.
Because self-efficacy has been related to some actions, “it is possible that there is a relationship between students' self-efficacy beliefs and their environmental literacy.” “People's judgments of their capacity to plan and carry out the activities required to accomplish specified results are referred to as self-efficacy (Perera and John, 2020).” “Self-efficacy beliefs impact individuals' task choices, effort, and perseverance.” “Individuals with high self-efficacy are more likely than those with low self-efficacy to work harder on a task and remain with it for a longer period.” According to one research, “teachers who lack confidence in their ability to encourage student learning tend to concentrate on the negative elements of their classrooms and are less likely to teach successfully (Hajovsky et al., 2020).” As a consequence, teachers' performance as educators is expected to increase if they “enhance their self-efficacy attitudes regarding environmental education” (Ardoin et al., 2020). The aforementioned scientific education literature “emphasizes the importance of students' self-efficacy beliefs and environmental literacy.” As a consequence, “instructors are required to have high levels of self-efficacy and understanding of environmental issues.”

2. “Methods and Purpose”

“This research investigates preservice teachers' environmental literacy and self-efficacy beliefs regarding environmental education,” as well as the possible links between the two. The project tackles the following research issues to achieve this dual goal:

What is the degree of environmental literacy among elementary school teachers in training? When it comes to environmental literacies “(knowledge, attitude, behavior, and concern),” “what is the level of preservice primary teachers' self-efficacy beliefs?”
Perceptions of one's own capacity to educate others about the environment may be linked to one's level of environmental literacy.

2.1 Sample

In the first semester of 2019-2020, preservice primary teachers enrolled in a university's Department of Elementary Education's "Environmental Education" course are the study's sample. Because these students were not pursuing a career in science teaching, they had not previously taken any classes in environmental education or science education. As a result of their results on the university admission exam in math, English language, and social sciences, Elementary Education was their choice of major. “Students in the Elementary Education Department” are excluded from answering questions on science. Thus, “many of these students had little or no scientific education previous to entering, and many had never received any environmental education.”

2.2 “Instruments”

2.2.1 “Environmental Education Self-Efficacy Belief Scale."

Students' self-efficacy views connected to environmental education were assessed using a “25-item questionnaire. In a 5-point Likert-type scale, academic competence, responsibility, instructional competence, and guiding perspective all have five items apiece (5 items).” “The scale ranges from 1 (strongly disagree) to 5 (strongly agree) (strongly agree).” It is necessary to change the item's code from 1 to 5 if the statement is negative (strongly disagree). In terms of repeatability, the scale has a 0.77 percent dependability coefficient.

2.2.2 Environmental Literacy Scale

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The survey consists of four parts: “environmental knowledge (ten questions), environmental attitudes (ten items), perceptions of environmental behavior (ten items), and environmental concern (ten items) (10 items).” For each correct response, you get one point, and for every incorrect one, you get zero. This is how the environmental component is graded. You may get as low as zero or as high as eleven based on these answers (all correct responses). “Most of the questions are based on a 5-point Likert-type scale:” “5 for very agree, 4 for agree, 3 for undecided, 2 for disagree, and 1 for strongly disagree.” Items with negative assertions have a coding of "strongly disagree" (5 points) and "strongly agree" (1 point).

2.3 Procedure

Both scales were completed before the semester started. We were able to analyze the data using a Person correlation coefficient. SPS was used to analyze the data, and SPS was also used to produce the “96 percent confidence interval.”

3. “Results and discussion."

There are “mean and standard deviations for each variable in Table 1.” In terms of the Environmental Literacy Scale, the most outstanding possible score was 80, “while the maximum for the environmental knowledge level was 10”. There is a modest level of self-efficacy in the participants' beliefs about environmental education and knowledge. They indeed have a strong sense of environmental awareness and care.

Table 1. Statistical analysis

	Mean	SD	N
“Self-efficacy”	50.58	8.49	62
“Knowledge”	7.35	2.50	62
“Attitude”	39.53	5.32	62
“Behavior”	75.29	8.29	62
“Concern”	35.63	8.19	62

According to a more in-depth examination of participant responses, 75% of participants knew what biodiversity was, “and 86% knew that industrial discharges are a major source of surface water pollution.” “75% also knew that Environment and Forestry is the primary federal government agency responsible for environmental protection (73 percent).” That ozone layer protects us from cancer-causing sunshine; the trees are renewable resources; those batteries are dangerous household waste; “and that hydroelectric power plants generate most electricity" are just a few of the facts that most of the responders appear to know (57 percent). There are several discrepancies between our results and the findings of Bano et al. (Bano et al., 2018). The most noteworthy finding in this study is that just 14 percent correctly answered questions on the process of storing nuclear waste and about the amount of carbon monoxide produced by automobiles (19 percent). There were also a few incorrect answers concerning vehicles and air pollution (Otto et al., 2019) (Kelley, 2020). However, they got 42% more right answers than we did for the nuclear waste question. The individuals' diverse origins may have contributed to this discrepancy (Verzosa 2020). “Students in our study majored in Elementary Education and had little or no science background,” “whereas those who participated in the study were more diverse, with majors such as Secondary Science and Mathematics Education, Foreign Language Teaching, Computer Teaching / Instructional Technology, and Elementary Education.”

The association between participants' environmental concern and their self-efficacy views in environmental education was small

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but substantial. That's not a surprise, as instructors passionate about environmental issues have a greater conviction in their ability to educate about them (Ahmed et al., 2021). “Their self-efficacy beliefs were not shown to have a significant association with their environmental knowledge, attitude, or conduct (Table 2).” “This may be related to the preservice primary teachers' lack of environmental awareness and self-efficacy attitudes (Al Sultan et al., 2021).” “Because of their lack of environmental knowledge and strong self-efficacy views, external sources such as the media may have impacted their attitudes and perceptions of environmental behavior.”

“Table 2. Correlations”

	“Correlation”	“Self-efficacy”	“Knowledge”	“Attitude”	“Use”	“Concern”
“Self-efficacy”	“Person correlation”	“2”	“0.004”	“0.123”	“0.007”	“0.295”
	“Sig. (2-tailed)”		“0.983”	“0.351”	“0.962”	“0.022”

“*p<0.06”

“4. Conclusion”

The results reveal that the preservice primary teachers who took part in this study lacked appropriate “environmental knowledge and self-efficacy attitudes about environmental education.” “Their understanding of nuclear waste and the role of automobiles in air pollution is minimal." “Environmental attitudes, perceptions of conduct, and environmental concern," on the other hand, “appear to be stronger than knowledge and self-efficacy beliefs,” according to the findings. “Environmental literacy emotional components” may have been affected by media, the Internet, and environmental groups. Technology, energy resources, resource consumption, industrialization's consequences, and the reasons and suggested solutions to significant environmental concerns should all be included in elementary education curricula.

The findings also show that “preservice teachers' self-efficacy perceptions about environmental education and their environmental concern are linked.” As a result, instructors' self-efficacy beliefs might be bolstered by their worry, enhancing their ability to teach well. The responsibility of elementary school teachers in fostering a culture of environmental literacy cannot be overstated. Education for elementary school teachers in Turkey should be enhanced. Environmental education should be improved, according to the conclusions of this study. Change may be guided by research comparing preservice teachers' knowledge of science and self-efficacy beliefs before and after therapy.

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