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The PhotoVoice method in Science, Social, and Environmental Education

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Abstract – PhotoVoice, which enables students to take an active role, has started to be used in schools by environmental, social, and science educators. In this context, this study was conducted to analyze the use of the PhotoVoice method in science, social, and environmental education studies. To collect data, Web of Science (WoS) was selected as the source. As a database, it is one of the most used resources by all researchers, including many disciplines. It was tried to reach all the resources related to PhotoVoice. Only "#PhotoVoice" was used as a keyword. But English was selected as the language. As a result, 2690 documents were reached. All data was then downloaded as *Tab Delimited File* and saved in a format of *.txt* file. Secondly, the process of selecting documents related to education was followed. For this, the *txt* files are transferred into an Excel file and saved. Afterward, documents related to education (science, social science and environmental) were selected (N=88). Research finding showed that although PhotoVoice is widely used in the fields of environmental education (f=38, 43.2%) and social sciences (f=39, 44.3%), it has been used at a very low rate in science (f=11, 12.5%). However, the majority of the documents were published as articles (f=81, 92%). Review studies (f=7, 8%) were published in the fields of environmental education and social sciences. As of 2008, studies in the field of education have started to be published. Between 2008 and 2010, PhotoVoice studies in environmental education were published. The number of publications has increased in recent years, especially after 2017. The highest number of publications was reached in 2020 (f=23, 26.14%) and 2021 (f=19, 21.59), whereas the decrease was determined in 2022 (f=11, 12.5%). The distribution of publications by years and fields tends to increase towards environmental education and social sciences. Furthermore, PhotoVoice studies widely used in environmental education are in *sustainability* (28.21%), *climate change* (15.38%), *environmental education* (10.26%), and *ecosystem services* (7.69%), respectively.

Keywords – Photovoice, Sustainability, Review, Science, Environmental Education.

I. INTRODUCTION

One of the most important developments targeted by environmental education in schools is to ensure that individuals' environmental knowledge and understanding increase positively towards nature. Although schools are important places offering environmental education, environmental education should be posed outside the school. In other words, it is necessary to use new approaches and methods in order to achieve the objectives of environmental education [1]. One of these approaches is to interact with nature. It is carried out by taking students out of the classroom environment and facing them with real environmental problems. Education direct practiced to the natural environment allows students to increase their level of responsibility and awareness for future generations. Therefore, researchers recommend that the curriculum

developed for environmental education should include activities and practices that will involve students in the natural environment. Interactions with nature, such as field trips or forest education, [2] are some of the activities that enable the raising of individuals' awareness in the construction of a sustainable future [3]. Active participation, direct experiences, and direct interaction with the problem situation have greater and stronger effects on individuals' behavior than indirect methods [4].

Today, one of the methods that take place as a new approach in environmental education is PhotoVoice. This method, which is based on active participation and helping to reveal a particular situation with the photographs taken by individuals, was developed by Wang and Burris [5, 6]. This method, which enables students to take an active role in environmental issues, collect data, and make observations, has started to be used in schools by environmental educators. In other words, it is a method based on the active participation of individuals [7]. In order for the theoretical knowledge learned at school to become meaningful and to have more effective in the lives of students, it will be useful to experience it through direct experiences [4]. Therefore, PhotoVoice has started to take its place in environmental education as a method that will ensure the active participation of students in out-of-school activities [8–12].

II. Materials and Method

Data source

To collect data, Web of Science (WoS) was selected as the source. As a database, it is one of the most used resources by all researchers, including many disciplines. Therefore, WoS was preferred as the data source. In the context of the research, two stages were followed. Firstly, it was tried to reach all the resources related to PhotoVoice. Only "#PhotoVoice" was used as a keyword. But English was selected as the language. As a result, 2690 documents were reached. All data was then downloaded as *Tab Delimited File* and saved in a format of *.txt* file. Secondly, the process of selecting documents related to education was followed. For this, the *txt* files are transferred into an Excel file and saved. Afterward, documents related to education (science, social science and environmental) were selected (N=88). Finally, all analyses were carried out taking into account 88 documents (Figure 1).

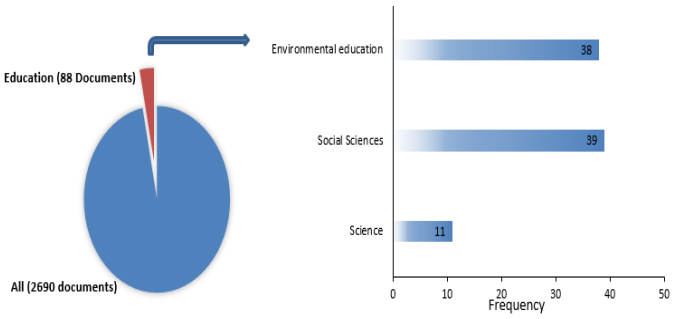

Figure 1. The selection process of documents

Statistical methods

SPSS and VOSviewer were used for the analysis. VOSviewer was used to identify the keywords and extract the relationships between the concepts. The *txt* files were uploaded to VOSviewer and analyses were performed. The data saved as Excel files were uploaded to the SPSS and the data were evaluated as percentage and frequency.

III. Results

PhotoVoice method is a new approach used in the field of education. A few of the studies in this field have been carried out in the field of education (f=88, 3.27%). In the field of environmental education (f=38, 1.41%), it was determined that this rate is very low compared to the total number (Figure 1). The first study on PhotoVoice was published by Wang & Burris (1997). In this article, published in a journal in the field of health, information about the conceptual, methodological, and application of the PhotoVoice method is included.

As shown in Table 1, although PhotoVoice is widely used in the fields of environmental education (f=38, 43.2%) and social sciences (f=39, 44.3%), it has been used at a very low rate in science (f=11, 12.5%). However, the majority of the documents were published as articles (f=81, 92%). Review studies (f=7, 8%) were published in the fields of environmental education and social sciences. On the other hand, in the science documents, there was no review research.

Table 1. Distribution of publications by document type and field

Field	Document type: Article	Review	Total	% of field
Environmental education	35	3	38	43.2%
Social science	35	4	39	44.3%
Science	11	0	11	12.5%
Total	81	7	88	100
% of total document type	92%	8%		

As of 2008, studies in the field of education have started to be published. Between 2008 and 2010, PhotoVoice studies in environmental education were published. The number of publications has increased in recent years, especially after 2017. The highest number of publications was reached in 2020 (f=23, 26.14%) and 2021 (f=19, 21.59), whereas the decrease was determined in 2022 (f=11, 12.5%). The distribution of publications by years and fields tends to increase towards environmental education and social sciences (Table 2).

Table 2. Distribution of publications by year and field

Field*	Publication year: 2008	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
EE	1	1	0	1	1	2	0	1	0	4	3	10	9	4	1	38
SS	0	0	2	0	1	0	1	0	6	2	4	8	10	5	0	39
S	0	0	0	0	1	1	0	0	0	0	2	5	0	2	0	11
Total	1	1	2	1	3	3	1	1	6	6	9	23	19	11	1	88
%	1.14	1.14	2.27	1.14	3.41	3.41	1.14	1.14	6.82	6.82	10.23	26.14	21.59	12.5	1.14	

*EE: Environmental education, SS: Social science, S: Science.

The number of keywords used by the researchers was organized in two ways. It was categorized as all studies and studies related to education. Of 1005 different keywords used in the education studies, 16 keywords are related to environmental education (2% of the total keywords). As shown in Figure 2, in terms of the frequency of total used keywords (f=1520), the frequency of keywords related to environmental education was determined as 3% (f=39).

PhotoVoice studies widely used in environmental education are in *sustainability* (28.21%), *climate change* (15.38%), *environmental education* (10.26%), and *ecosystem services* (7.69%), respectively (Figure 3). Furthermore, the PhotoVoice method is used in a wide range of different fields in environmental education. Of which are; *Conservation* (5.13%), *Environmental justice* (5.13%), *Biosphere reserve* (2.56%), *Climate action* (2.56%), *Climate variability* (2.56%), *Ecosystem benefits* (2.56%), *Environmental activism* (2.56%), *Environmental change* (2.56%), *Environmental health* (2.56%), *Environmental perception* (5.13%), *Environmentally sensitive industries* (2.56%), and *Rural environment* (2.56%).

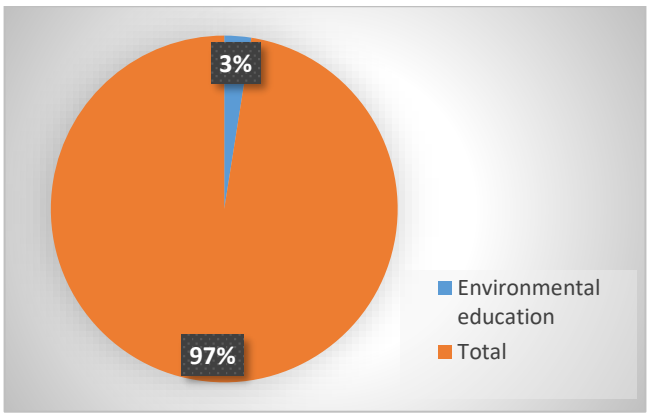

Figure 2. Percentage of keyword frequency about environmental education in total keyword frequency.

IV. DISCUSSION

PhotoVoice method has recently started to be used in environmental education (Table 2). It may be said that it is especially related to environmental science subjects (Figure 3). In contrast to science education, social and environmental sciences are more widely favored in education (Table 1). The suitability of environmental education in terms of out-of-school activities enables the use of this method in environmental education. As a matter of fact, in recent studies, students interact more with the natural environment. Kowasch et al. (2022) indicated that interacting with nature and experiencing it directly with the sensory experiences have a positive effect on individuals' awareness. It was emphasized that a relationship between human and nature should be established for the continuity of ecosystems. It is stated that this is an important factor for the protection of nature. The PhotoVoice method was used by Hayik (2021) to reveal the situation in relation to environmental problems in city. In the research, students evaluated the environmental pollution caused by people with the photographs they took in various parts of the city. Students identified 4 different situations as environmental problems. Among these problems, it is stated that a high percentage is related to *garbage disposal*. As a result of the research, it was pointed out that students' directly addressing environmental problems had a significant impact on awareness [7]. Similarly, in the research where the PhotoVoice method was used, the issue of climate change was addressed [12]. In the research, it was aimed to reveal the effects of climate change through students' research [12].

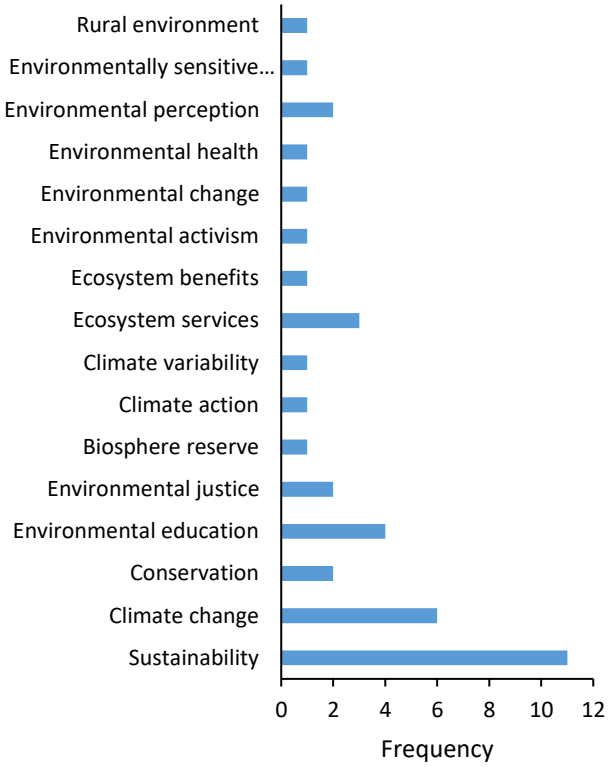

Figure 3. Frequency of the keywords for which the PhotoVoice method is used in environmental education.

V. CONCLUSION

The PhotoVoice method should be used as a teaching method in schools, allowing students to interact with nature and collect direct information about environmental problems. As a matter of fact, it is expressed that this method will be effective in moving students to the out-of-school environment. It offers students the opportunity to observe and evaluate the theoretically learned knowledge outside the school.

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