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Outdoor Learning in Environmental Education: Evaluation of Science Curriculums

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Abstract-This study was conducted in order to examine the objectives related to environmental education in the curricula taught from primary school to the last grade of high school in terms of out-of-school activities (outdoor learning). Within the scope of the research, the objectives related to the environment were categorized in terms of "Investigation-Presentation (IP)", "Observation-Presentation (OP)", "Project (P)" and "Active participation (AP)". The document analysis approach, one of the qualitative research methods, was used. Within the scope of the determined themes, objectives for each class and grade level were arranged as percentage and frequency. As a result of the findings obtained, it was determined that at the primary and secondary school levels, objectives encouraging students to out-of-school activities were included, but at the high school level, objectives related to the determined themes were included very little. A total of 302 objectives were included in the 3-8 grade levels, but the number of objectives related to the environment was determined as 56 (IP: 3, OP: 2, P: 5, AP: 5). At the high school level, the highest number of objectives related to environmental education was included in biology curricula. However, in terms of out-of-school activities, only physics curricula were included. As a result, it was determined that the number of learning objectives for out-of-school activities in the curricula was not sufficient. Therefore, it would be useful to include objectives that encourage out-of-school activities in the developed curricula in order to achieve the aims of environmental education.

Keywords – Curriculum, Environmental Education, Outdoor Learning, Objective, Active Participation.

I. INTRODUCTION

The main aim of science is to increase students' interest and motivation. While developing curriculums, it is aimed to improve students' learning of science in a positive way [7]. The most effective way to ensure this is to experience real experiences. In other words, they are able to apply the knowledge that has learned in school [13]. There is a similar situation in environmental education. Because the place of out-of-school activities in increasing students' awareness and sensitivity about the environment is emphasized by many researchers. In other words, it is aimed to increase the interaction of students with nature in environmental education given in schools [6, 11]. As a matter of fact, it was stated that there was a significant increase in the success and knowledge of students who observed the development of plants in the natural environment with a field trip [13].

Environmental education is a process starting from childhood. In increasing individuals' awareness, it is necessary to include environmental education effectively at all levels of education. Especially early childhood period constitutes the most important age group of this process [4]. However, in order for environmental education to achieve its goals, it should be implemented by including out-of-school activities (e.g. field trips, citizen science, and observation environment) in formal education [1, 3, 10].

Considering the importance of out-of-school activities, this study aimed to evaluate the environmental objectives in science curricula in terms of out-of-school activities.

II. Materials and Method

In the research, the document analysis approach was used which is one of the qualitative research methods. Within the scope of the research, the curricula taught in science classes were examined. In this context, primary, secondary, and high school curriculums were used to collect data. While analysing the objectives, four different out-of-school categories were identified ("Investigation-Presentation (IP)", "Observation-Presentation (OP)", "Project (P)" and "Active participation (AP)"). In addition, total objectives-"O" and environmental objectives-"EO" were also calculated. The learning objectives were classified according to these categories and arranged as frequency and percentage.

III. Results

The findings are organized according to grade levels.

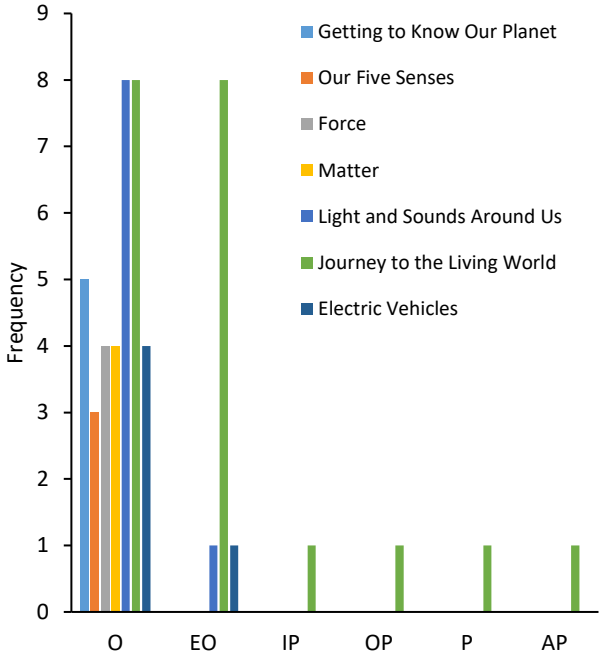

Fig. 1 Distributions of objectives at the 3rd grade curriculum

It was determined that 10 out of 36 objectives are related to the environment (27.8%). It is seen that environmental education objectives are included in *Light and Sound Around Us*, *Journey to the Living World*, and *Electric Vehicles* units (Fig. 1). However, the objectives related to out-of-school activity themes were included only in the unit of *Journey to the Living World*.

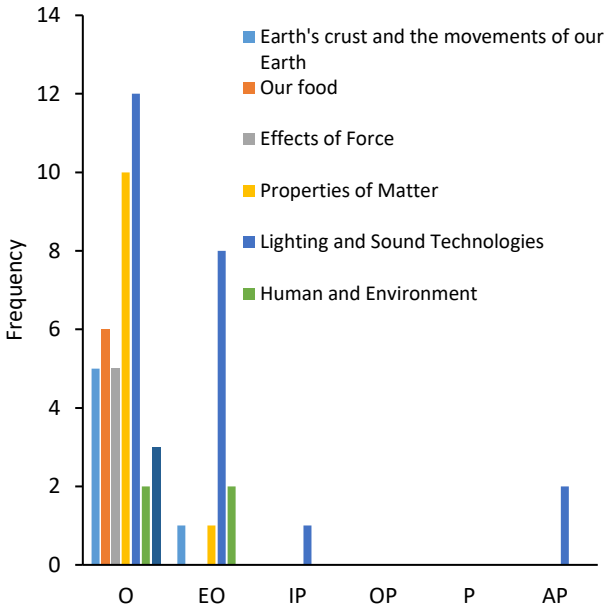

Fig. 2 Distributions of objectives at the 4th grade curriculum

As shown in Fig. 2, only two categories (IP:1 and AP:1) are included in the 4th grade. The majority of objectives about environmental education (8 out of 12) are given in the unit of *Lighting and Sound Technologies*. At this grade, 27.9% of objectives are related to environmental education.

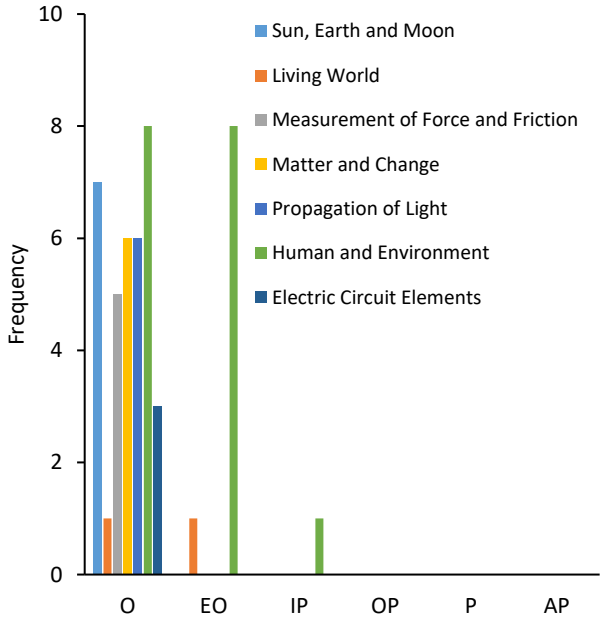

Fig. 3 Distributions of objectives at the 5th grade curriculum

Considering the total number of learning objectives, it can be said that the distribution of out-of-school activities is very low.

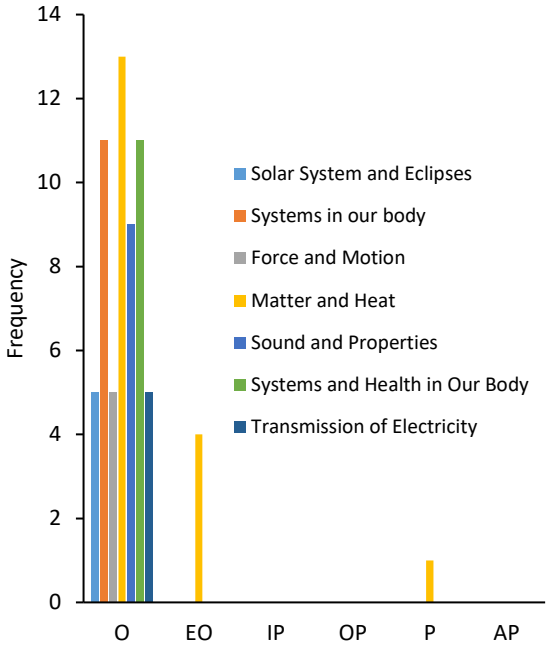

Fig. 4 Distributions of objectives at the 6th grade curriculum

In elementary and secondary school levels, the grade with the least environmental learning objectives is the 6th grade level (6.8% of total learning objectives). Among the categories analyzed, it is seen that the learning objectives are given only in the category of "*Project-P*". Furthermore, the objective was determined in the unit of *Matter and Heat*.

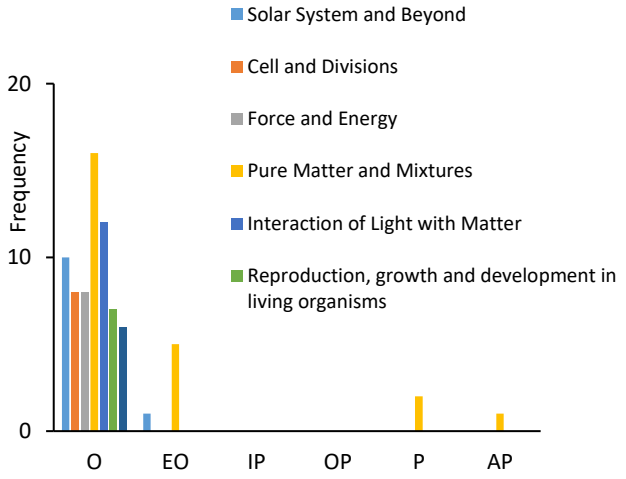

Fig. 5 Distributions of objectives at the 7th grade curriculum

As in the 6th grade (see Fig. 4), it is seen that the rate of learning objectives related to the environment in the 7th grade is given at a very low percentage (8.96% of total learning objectives) (Fig. 5).

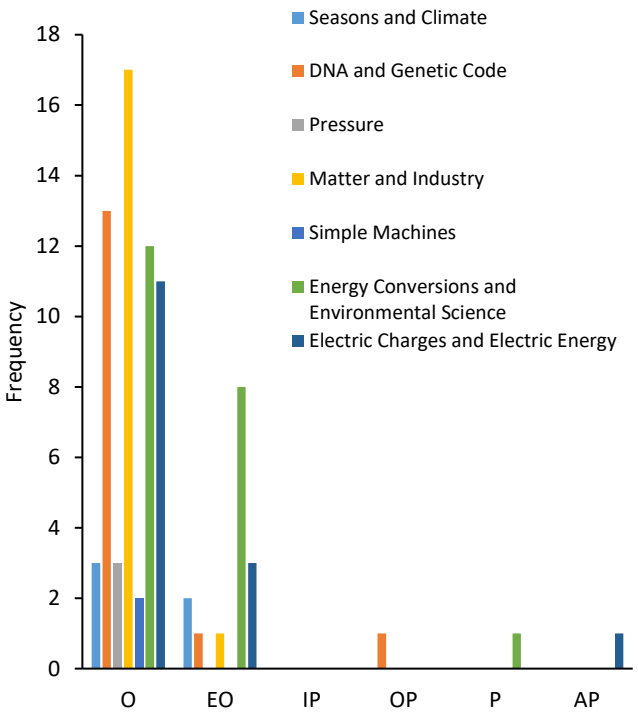

Fig. 6 Distributions of objectives at the 8th grade curriculum

As shown in Fig. 6, the learning objectives related to three different categories were included (OP:1, P:1, and AP:1). Moreover, environment-related objectives are included in 5 units (*Seasons and Climate*, *DNA and Genetic Code*, *Matter and Industry*, *Energy Conversions and Environmental Science*, and *Electric Charges and Electric Energy*).

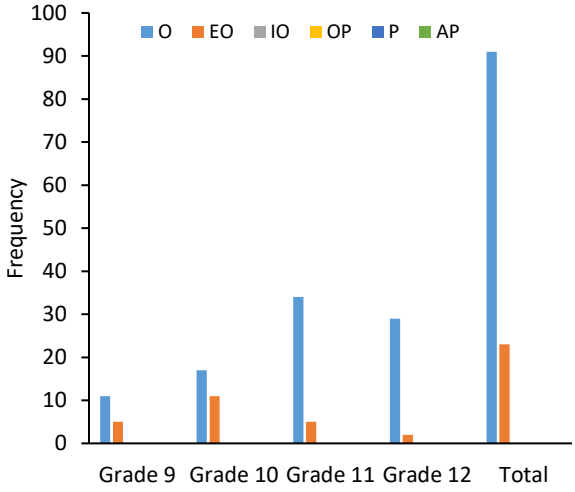

Fig. 7 Distributions of objectives at the biology curriculum

Considering the distribution of the learning objectives according to the grades, the highest percentage of objectives was found in Grade 10 (64.7% of the total objectives given at Grade 10). However, it was determined that there were no learning objectives related to the analyzed categories in the biology course. 25% of the total

objectives are related to environmental education. On the other hand, the least percentage of objectives is found in Grade 12 (6.9% of the total objectives).

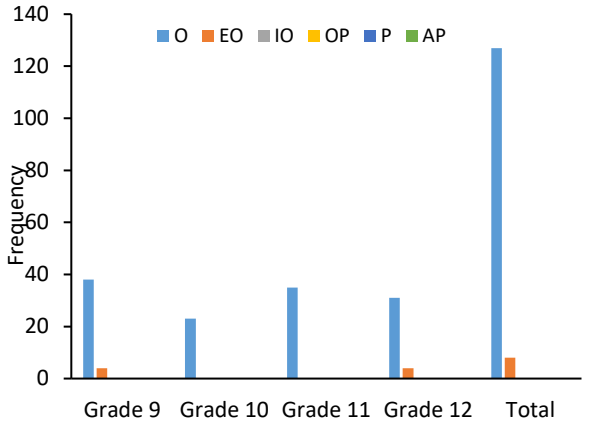

Fig. 8 Distributions of objectives at the chemistry curriculum

In the chemistry curriculum, learning objectives related to environmental education were included at a very low percentage (6.3% of the total objectives). In addition, it was determined that only 9th and 12th grades were included in the objectives of environmental education. On the other hand, there were no objectives for out-of-school activity categories.

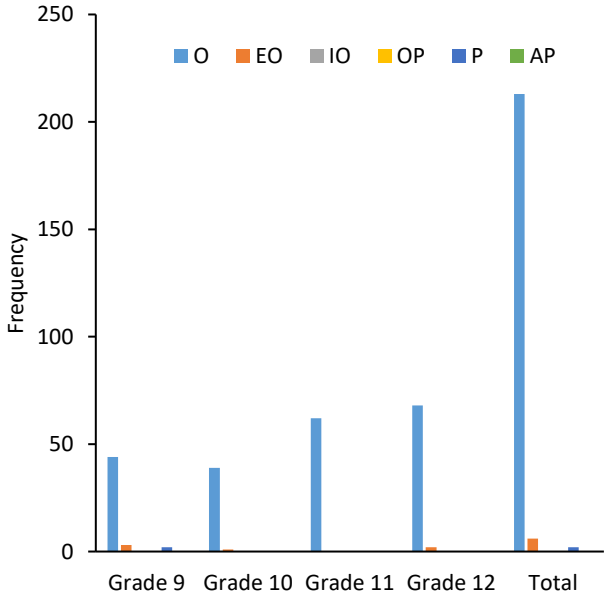

Fig. 9 Distributions of objectives at the physics curriculum

The physics curriculum is one of the courses with the least number of learning objectives in terms of environmental education (2.8% of the total objectives). Among the categories analyzed, it is seen that the learning objectives are given only in the category of "Project-P". Environmental objectives are included only in 9th and 12th grades.

IV. DISCUSSION

It was determined that the environmental learning objectives given in the curricula taught at all science education levels were not included in a way to engage students to interact with the environment. Although outdoor activities are included at primary and secondary school levels, it is determined that there are not enough learning objectives at the high school level. As a matter of fact, 18.54% of the total objectives at primary and secondary school levels are related to environmental education. Furthermore, the distribution of environmental objectives according to the analyzed categories; IP: 5.36%; OP: 3. 57%; P: 8.9%; AP: 8.9%). However, out-of-school activities have been neglected in high school curricula. However, studies have emphasized the importance of out-of-school activities and the need for students to be more involved in out-of-school activities [8, 12]. Especially environmental education in early childhood is reflected in children's future behaviors. Therefore, providing effective environmental education at all levels will play an important role in preparing children for the future [4]. Because childhood is one of the most important periods in which children's minds are shaped. Therefore, environmental education given to students in primary school period should increase the level of awareness [5]. However, environmental education should be included in curricula in a lifelong way. Including only certain disciplines makes it difficult to achieve the objectives of environmental education. Environmental education becomes more meaningful through active participation and continuous interaction with nature [2, 9]. Because the most effective way to establish a deep bond with nature is to interact with nature. Especially today, people are more adapted to city life and spend less time in nature. Therefore, curricula should be implemented in such a way that students interact more with nature [3]. Unfortunately, the findings obtained show the opposite of this situation. The learning objectives do not encourage students to participate in out-of-school activities. Especially at primary, secondary, and high school levels, environmental education is given in the form of theoretical knowledge.

V. CONCLUSION

In order for environmental education to achieve its goals effectively, the objectives given in the curricula should be increased for out-of-school

activities. Students should directly observe the problems related to nature and the environment and take an active role in solving these problems. In the curriculums examined, it was determined that environmental learning objectives were not organized in a way to involve students in out-of-school activities and were included only in certain topics (or disciplines).

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