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CURRICULUM ON AQUATIC ECOSYSTEMS IN PRE-UNIVERSITY AND UNIVERSITY EDUCATION IN ALBANIA

SUMMARY

The conservation and management of natural ecosystems in general and aquatic ones in particular at the local and global level require an increase in the level of education of pupils and students. To face the challenges and competitive global economy, students must have the competencies as well as the capacity to take advantage of the opportunities offered for personal development, the advancement of society and the protection of the environment. The purpose of this study is to present an analysis of legal acts, bylaws, strategic documents and curricular framework related to aquatic ecosystems, their types, level of pollution, eutrophication, biodiversity, included in the curricula and textbooks of pre-university education and high in Albania. The study data were provided by narrative analysis of basic education policy documents and interviews conducted with policy makers and specialists of pre-university and higher education. Data analysis shows that pre-university education textbooks mostly convey to students learning about the aquatic environment at a theoretical level of knowledge and very little at a practical level. There is also no coherence between the pre-university education curriculum and higher education on water and aquatic environments. At the end of the study are given some recommendations regarding the improvement of curricula for aquatic environments, the continuation of the curriculum of pre-university education and higher education on aquatic ecosystems as well as the coordination of legal acts and by laws of the responsible institutions.

INTRODUCTION

Environmental education in the new basic education curricula aims to create in students the skills to act for the environment, which means that in addition to

learning about behaviors and lifestyles oriented to the benefit of environmental conservation and protection, it should enable them for problem solving activities.

Issues of environmental education are dealt with in a special way in the subjects of biology, physics, geography, chemistry, and civic education. The learning contents in these subjects not only help to increase the level of understanding and acquisition of environmental knowledge, but enable the preparation and ability of students to face today's environmental problems and to solve them.

One of the areas of learning in the curricular framework of pre-university education (APU) is the field of natural sciences, through which students appreciate the role of science in local, national and global issues that support sustainable development, such as those related to health, natural resources, the environment and the impact of human activity and natural phenomena on it. This field creates opportunities for students to develop a solid base of biological, chemical, physical, and earth science scientific knowledge, as well as the competencies to select and integrate the scientific knowledge and methods necessary to explain and predict phenomena, to creatively applied them in new situations and circumstances, and to appreciate the dynamic nature of scientific knowledge.

MATERIAL AND METHODS

The study data were provided by narrative analysis of basic education policy documents and interviews conducted with policy makers and specialists of pre-university and higher education. Also main subject programs in elementary, secondary, high school and university are analyzed. In our study we are focused on subjects such as biology, chemistry, environmental education, ecology, hidrography and hydrobiology. The 12th grade subjects are not included in the study as they are part of the optional curriculum. The subject programs drawn up by the Agency for Quality Assurance of Pre-University Education and approved by Ministry of Education and Sport.

RESULTS AND DISCUSSION

Tab. 1- Teaching load for aquatic ecosystems in the elementary and secondary school (%).

Study Program	Subject Program	Teaching load
Elementary school	Knowledge of nature	44%
Secondary school	Chemistry	25%
Secondary school	Biology	35%
Secondary school	Geography	62%
Secondary school	Physics	10%

Tab. 2- Teaching load for aquatic ecosystems in the high school (%).

Study Program	Subject Program	Teaching load
High school	Chemistry	2.1%
High school	Biology	11.9%
High school	Geography	14.5%
High school	Physics	2.8 %

Tab. 3- Teaching load for aquatic ecosystems in the bachelor degree (%).

Study Program Ba	Subject Program	Teaching load
Preschool	Geography	14%
Elementary school	Environmental education	14%
Biology- Chemistry	Ecology	15%
Journalism	Hidrography	7%
History -Geography	Hidrography	14%
Civic education	Hidrography	7%
Histori- Germany	Hidrography	14%
Geography -Italian	Hidrography	14%

Tab. 4- Teaching load for aquatic ecosystems in the master degree (%).

Study Program	Subject Program	Teaching load
Biology- Chemistry MP	Enviromental education	27%
Environment protection Msc	Hidrobiology	100%
Environment protection Msc	Enviromental Microbiology	40%

From the analysis of the texts for each grade of elementary, secondary and high school in the subjects knowledge of nature, physics, biology, chemistry and geography results that topics in aquatic ecosystems are respectively: Knowledge of nature 44%, Chemistry 25%, Biology 35%, Geography 62%, Physics 10%.

The Oxford University Press, (LARGE *et al.*, 2013), (HUDSON *et al.*, 2014), textbooks fully reflect the learning outcomes of aquatic environments which connect the competences of the field of natural sciences with the key competences of the subjects program, while the textbooks of Pearson Education Limited (BRIDGES *et al.*, 2009), (LIEVESLEY *et al.*, 2019), (BRAND *et al.*, 2017) and Cambridge University Press, (BOARD *et al.*, 2017), (BAXTER *et al.*, 2019) adequately reflect aquatic environments in relation to the subject programs.

Alternative texts of the same class reflect water environments in different percentages in relation to the subject program. The subject program of physics in the secondary school has a very low percentage of topics (average 10%) compared

to the subject programs of geography (average 62%) and biology (average 35%). Subject programs contain interactions systems, cycles and diversity. The subject program of chemistry and physics has very low percentage of topics respectively 2.1 %, 2.8% in relation to the subjects program of geography and biology respectively (average 14.5%, 11.9%). In the subject programs of the bachelor degree Ba, of social sciences, topics on water ecosystems have the lowest percentage in civic education and journalism 7%, and the highest is in history-geography 14%. These topics are included only in the hydrography subject. In education programs at the bachelor degree, teaching loads on aquatic ecosystems are in preschool, elementary school and biology-chemistry respectively (average 14%, 14%, and 15%). These topics are included in the geography, environmental education and ecology subjects but this is no topic in the subject of physics. In the professional master, and scientific master, topics on aquatic ecosystem are respectively environmental education 27%, hydrobiology 100% and environmental microbiology 40%.

CONCLUSIONS

1. In programs and texts, aquatic environments are included in the themes of diversity, interactions, systems and cycles, but there is no regularity in their distribution within the themes;
2. Texts that are adapted to the subject program make the student aware of issues related to health, his well-being, the use of natural resources, and the impact of man on the environment, climate change and biodiversity;
3. In the programs and texts that are adapted there is a combination of cross-curricular topics between the subjects of a class and between classes in the field of natural sciences and the field of society and the environment, also in the texts student-centred teaching strategies such as experiments, problem solving are used , projects and observations in nature;
4. The learning outcomes of the subject programs, such as knowledge, skills, abilities, procedures, attitudes and values, are well reflected in the programs and texts that have a high percentage of aquatic environment lessons.

RECOMMENDATIONS

1. The establishment of standards for the distribution according to the degrees of the curriculum of aquatic environment topics in the subject programs and the cross-curricular integration through the learning results of the competences of the field and key competences;
2. The reflection of the standards in the textbooks in order to raise the student's awareness in matters related to health, his well-being, the use of natural re-

sources, the impact of man on the environment, climate change and biodiversity;

3. Integration of the curriculum of pre-university education with the curriculum of higher education in order to ensure continuity for the reflection of the.

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