**THE CONTEXT OF SUSTAINABLE DEVELOPMENT IN TURKISH ELEMENTARY SCIENCE CURRICULUM**

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| ***Abstract:*** *Ministry of Education introduced the notion of Sustainable Development (SD) into the revised curricula in 2013. Moreover, SD included as a chapter for 8th graders. In the current study, national elementary science textbooks were examined by means of the integrating SD into the contents. Moreover, the objectives of the SD chapter were analysed. The context of curriculum stated that students develop awareness about benefits of efficient use of natural resources by means of society, individual, and economy. However, when the chapters were explored, no special emphasis or integrations were attributed to SD. Rather, a chapter for the 8th graders was added into the curriculum and it was related to the recycling and SD. When the objectives of the chapter were examined, some objectives were too general that 4 lecture hours might not be enough to attain the objectives. Besides the written objectives, no objectives were found for promoting competencies reported by UNESCO. The content and the objectives of the SD lecture in science are too general and need some revisions. Moreover, it could be better to integrate the context of SD into the whole curriculum rather than having one chapter in grade level 8.The objectives may be simplified and retrofitted in order to construct meaningful learning. Besides, teaching the concept of SD via recycling may not be sufficient to embrace the notion of SD. The national science curriculum should also include some other SD issues.*  ***Keywords:*** *[Education for Sustainability, Curriculum and Instruction, Elementary, Textbooks]* |

# Introduction

Defining the concept of Sustainable Development (SD) is a challenging issue since its definition has been evolving over time (Egelston, 2006). Nevertheless, the widely known definition is the one which was mentioned in Brundtland Commission Report, Our Common Future as, “…development that meets the need of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p. 43). In order to elucidate the elements of SD, UNESCO (2010) envisioned SD as four dimensions named as natural, economic, social, and political. As the context of SD and its probable dimensions was evolved, education emerged as one of the crucial elements to achieve SD goals. Correspondingly, the concept of Education for Sustainable Development (ESD) was incorporated in the SD programs intended to promote education and public awareness throughout the 21st century. In Agenda 21 (1992), it was affirmed that education should be regarded as an indispensable ingredient for enabling individuals to meet the solutions for both the present and the future problems. Based on the notion of ESD reported in Agenda 21, it has been taking places into all levels of education namely early childhood, elementary and secondary school education as well as higher education (Webster, 2004) in all over the world.

The content of ESD fundamentally aimed to enable individuals to grasp essential knowledge, skills, attitudes and values to attain a sustainable future (UNESCO, 2015). Besides, ESD requires coopeataive teaching and learning methodologies that support and empower individuals to modify their behaviour and feel responsible for sustainable future. UNESCO (2015) declared that ESD contains key SD issues for integrating teaching and learning like climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption. Nevertheless, every nation is allowed to choose their own main topic related to their local needs (Mert & Talu, 2012). For instance, Latin American Countries put biodiversity and deforestation on the agenda, whereas African Countries choose poverty, and Arab Countries focus on desertification.

*Education for Sustainable Development in Turkey*

Republic of Turkey is largely located in Western Asia and some in Southeastern Asia. There are approximately 76.7 million people living in Turkey (TUIK, 2014). There are 45,551 elementary schools (from 1st to 8th grade) and 11,053,315 students according to the Ministry of National Education Statistics (2014) in 2013-2014 semesters. ESD initiatives are implemented in two categories as governmental and non-governmental organizations under the auspices of Ministry of National Education and Ministry of Environment and Urbanization (Sağdıç, 2013). Besides the governmental and non-governmental projects, the context of sustainable development has been introduced to 8th graders covering the definition of sustainable development, usage of natural resources, and recycling (MoNE, 2013).Moreover, vision of national science curriculum is changed in way that embracing the notion of SD.

*Aim of the Study*

In line with the inclusion of the sustainable development into Turkish Elementary Science Curriculum, this study aimed to investigate the context of sustainable development in this curriculum. By investigating the inclusion of sustainable development, it was intended to analyze how sustainable development was embraced by the curriculum and how it may contribute to reach sustainable development goals from a national perspective.

**Method**

Content analysis was chosen for this study since the textbooks and the objectives were examined (Fraenkel & Wallen, 2006) to comprehend how national elementary science education objectives and textbooks integrate the notion of sustainable development into the curriculum and how the chapter’s objectives reflect the principles of sustainable development.

**Results**

It is stated that scientifically literate individuals who are able to inquire, make decisions effectively; solve problems; confide in themselves; cooperate and communicate effectively; and develop awareness on sustainable development are the ones who have necessary knowledge, skills, positive attitudes, perceptions and values for natural and physical sciences as well as understanding of the relationship between the science and technology, society, and the environment and psychomotor skills. Besides the vision of national science curriculum, SD perception is also integrated in some of the goals of science lectures.

4.1 Realize the reciprocal interaction between human, environment, and society

4.2 Develop an awareness of sustainable development by means of society, economy, and natural resources

The context of national science curriculum clearly states that students should realize to efficient usage of natural resources enable future generations to provide their needs and develop awareness about possible benefits of efficient use of natural resources (society, individual, and economic). Below, the context of ESD unit for 8th graders and its objectives are published by the Ministry of National Education is given.

*The Context of ESD Unit in National Science Curriculum*

Grade Level: 8th grade

Unit 5: Energy and Life

General Objectives: At the end of the unit, students should be able to;

- explain food chain and its elements

- explore the interrelatedness of the elements of food chain

- realize the cycles (water, carbon, etc.) in ecologic life

- develop an awareness related to sustainable development and sustainable life styles

- make provision against unsustainable natural resource consumption in the context of sustainable development

- develop awareness on biotechnology

- compare and contrast the effects of biotechnology

Subunit 5.3: Sustainable Development

Topics/Concepts: Sustainable Development, Efficient Usage of Natural Resources, Recycling

Specific Objectives: At the end of the topic, the students should be able to;

- design a project about the efficient usage of natural resources.

- discuss the importance of recycling with the help of the scientific data, appreciate it contribution to national economy, and offer some solutions related to the recycling.

Although the concept of SD is introduced in the national science curriculum, the education program has not been started yet since 4+4+4 education system is implemented for three years and new 8th grade generation is going to start next year. Moreover, we do not have yet the new version of 8th grade science book in order to evaluate the objectives and proposed lecture hour. Even though this is a very good step to include SD into national curriculum, there may be some concerns regarding the scope of SD unit based on the scope of the objectives and the amount of suggested lecture hours (4 hours was recommended).

First and foremost, every nation is free to focus on their issues in SD regarding their local needs. However, by looking the objectives of the unit, it can be inferred that it does not have local SD issue related to the national context. If it was included, it would have been written explicitly as “develop an awareness related to sustainability in a local context”. Hence, students may memorize the definition of SD and may not be able to learn it in depth without any local examples (e.g. sustainable water management of Seyhan Watershed). That is to say, embedding SD concept into an issue like deforestation, biodiversity etc. would be more beneficial in order to develop an awareness related to sustainability.

When the objectives of the unit and proposed lecture hours are considered, there are also question marks as a second concern. Some objectives are so assertive in a way that 4 lecture hours may not be enough to the students to gain necessary objectives. For instance, the definition and the scope of SD are still open to debate and sometimes it is hard to understand easily. Hence, the objective which is “make provision against unsustainable natural resource consumption in the context of sustainable development” becomes a little bit abstract concept since the students should understand the concept clearly in order to make provision. It may not be so easy to reach these objectives in four hours. Another objective “design a project about the efficient usage of natural resources” is an objective that takes one semester rather than limited time within a lecture. Apart from the written objectives, the curriculum does not have objectives that promote competencies reported by UNESCO. Discarding those skills, the students’ understanding of SD may not be qualified enough as intended. To sum up, the objectives can be simplified and retrofit into 4 lecture hours in order to construct meaningful learning and in-service training session should be arranged as soon as possible.

Last, but not least, teaching the concept of SD via recycling may not be efficient enough to embrace the notion of SD. The national science curriculum should also include some other SD issues like climate change, biodiversity loss, desertification, and deforestation in order to enrich the content of the lecture. As mentioned before, every region in Turkey may have different SD issues. Hence, teachers may include these local context as well as and global SD issues and challenges.

**Discussion**

To conclude, Turkey introduced SD into national science curricula while some other countries have not yet reached. Hence, it is a good start, but it is still needed to work on it more to persuade the students live sustainable life style. The content and the objectives of the SD lecture in science are too general and need some revisions. Moreover, SD should infuse all the other curricula like social studies, literature, and math rather than just science curricula. Student can make some calculations related to biodiversity loss or water consumption in math lecture, while they can write essays and participate in class discussion on the notion of SD in elementary level. In this way, the concept of SD might be more fruitful rather than teaching it as an abstract and separate concept. Moreover, in-service training programs should be arranged in order to raise the teachers as ESD literate teachers since they did not have related courses in their undergraduate program. Besides the national curriculum, the projects approved by Ministry of National Education and Ministry of Environment and Urbanization should be promoted as an integral part of SD unit and they should also be implemented in early grade levels (from childhood education to 7th grade). Last, Turkey has numerous SD projects in almost every region conducted by non-governmental and governmental organizations. Ministry of National Education may allow teachers to decide their own SD topic according to the region provided that the standard objectives are met. To exemplify this, the project “Sustainable Tea Agriculture” funded by Lipton can be taught in the Black Sea Region, whereas “East Anatolia Organic Livestock Breeding” conducted by IFOAM-International Federation of Agricultural Movements can be taught by in the Eastern Anatolia Region.

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