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Identifying and Comparing the Degree of Difficulties Biology Subjects By Adjusting It is Reasons in Elementary and Secondary Education

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Abstract

The purpose of this study was to determine elementary school eighth grade students' and secondary school 12th grade students' perceptions of having difficulties with respect to understanding Biology subjects, and whether they still had difficulties in this hardly learnt subjects when they came to high school after the elementary school. The results revealed that "Controller and Organizer Systems", a biology subject in elementary school and "Photosynthesis", a biology subject at secondary school in Turkey were more difficult to understand than other biology subjects for the participants in our study.

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1. Introduction

Recent developments in science and technology (especially in genetics, bio-technology, molecular biology etc.) have improved so much that they have changed our lives to a great extent. Developments in biology have particularly emphasized the significance of biology. Consequently, academic programs of the biology course are arranged in a way that will support the objective to train biology literate individuals who are aware of themselves and surroundings, and who know the nature of science and biology, and can analyze the problems they encounter. (Ministry of National Education) Regarding the main objective of the biology course, researches have been carried out that reveal the necessity of literate biology students. (Baran *et al.*, 2002; Tuan *et al.*, 2005).

Developed countries see biology training and learning as a cultural necessity, and they have conducted studies to improve the quality of biology training. These studies aimed to update science programs permanently, and to establish programs intended towards needs. (Hurd, 1998; Ayas, 1995). To conclude, science and biology have a great role in education (Baran *et al.*, 2002).

As well as the importance of science and biology in education, biology has a great role in our daily lives, too. Though we are so close to biology, it is a difficult course for many students (Steak, 1995; Yeşilyurt and Gül, 2008). When the effect of biology on our lives is considered, linking biology to tangible experiences will ensure effective and permanent learning. The students must be outside the traditional model, that is, they must be active. Laboratory studies will enable the students to be active. Furthermore, through such studies requiring activities (field studies,

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travel-observation etc.) students will learn the subject better, realize their mistakes, correct their errors about the concept, and enjoy the lesson more (Uzun and Sağlam, 2005; Uzun and Sağlam, 2003; Sinan and Karagöz, 2010). Latin concepts take place in course books. This causes learning difficulties. When these are replaced by Turkish ones, learning will be easy and permanent (Kete and Acar, 2007).

In previous studies, difficulties in learning biology were studied and the reasons were revealed (Lazarowitz *et. al.* 1992; Tekkaya *et. al.* 2000; Güneş and Güneş, 2005). It was seen that their success in biology course was affected by their attitudes towards biology. (Mutlu, 2006; Üredi and Üredi, 2005). The factors affecting attitudes towards biology were also investigated, and analyzed depending on factors such as gender, teacher, school administrators, school, class, location of the primary school the students graduated from and their general academic success etc. (Ekici and Hevedanlı, 2010; Prokop *et. al.*, 2007; Uitto *et. al.* 2006; Üredi and Üredi, 2005; Yeşilyurt and Gül, 2008).

The reasons for learning difficulties in biology subjects need to be identified through comprehensive studies, and recommendations should be presented. Thus, research depending on a specific variant may not give satisfactory results.

In our study, we aim to deal with the biology subjects in primary and secondary education in terms of learning difficulties, and to compare the learning difficulties in corresponding biology subjects in primary schools and secondary schools with their reasons.

2. Material and Method

2.1. Target Population and Sample

As for primary schools' target population, the study covers eighth grade students in the city centers of Bursa and Balıkesir, and their towns. As for secondary schools' target population, the study covers the 12th grade students in Balıkesir city.

As for primary schools' sample, the study covers one randomly chosen primary school in Balıkesir city centre, two randomly chosen primary schools in Balıkesir, Gönen town, and three randomly chosen primary schools in Bursa city centre. As for secondary schools' sample, the study covers four high schools in Balıkesir city.

2.2. Data Collection

In order to identify learning difficulties for the primary school second stagers and secondary school last grade students, grading scales were prepared by the conductors of this study. For this purpose, primary education program was studied; unit and subject titles were identified. In the scale ,there were 60 items, and two open-ended questions that aimed to identify the reasons of the degrees of difficulty. Concerning the secondary education, unit and subject titles found in 9th, 10th and 11th grade classes biology courses were identified. A survey covering the 26 items and two open-ended questions elected to be applied to 12th graders was prepared. In order to identify the biology subjects' degrees of difficulty, the primary school and secondary school students were asked to give 1-10 points to the items mentioned above. (1 for the easiest, and 10 for the most difficult).

2.3. Data Analysis

$$\text{Difficulty index} = N_k / N_t \times N_m$$

Nk: Total amount of the points given to subjects

Nt: Total number of students

Nm: Total number of subject titles

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