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## 5<sup>th</sup> Grade Elementary Science Education Textbook - Critical Analysis

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**Abstract:** *Aim of the present study was to determine teachers' opinions about 5<sup>th</sup> grade science textbook which is based on 3. 4. 5. 6. 7. 8. Grade science curriculum. The participants of the study were twenty two science teachers. Interview from which included open-ended questions was used to collect data. The result of the study reveals that most of the participants think the course book is consistent with outcomes and visual design of the book is appropriate to the student level.*

**Keywords:** *Course book review, Elementary Education, Science Education*

### 1. INTRODUCTION

In our century information and technology have been developed rapidly therefore using materials, methods and techniques in education also change. Even though many modern educational tools can be used in education such as tablets, smart boards etc., teachers' and educational institutions' the most favored teaching tool is printed books (Gönen et al., 2011). Literature indicates that source of the education is course books for most countries (Pettersen et al., 1991; Aslan and Güneş, 2008). TIMMS studies indicate that teachers spend their time approximately fifty percent of their time for using course books (Schmidt, McKnight and Raiz, 1996). Due to this reason the content analysis of course book is very important. Textbooks must be qualified in terms of their roles in educational environment. To carry out course books' functions fully, these books must have the necessary qualifications in terms of figures and content (Kılıç, 2006).

Textbooks are effective and commonly used educational tools to give information to students and teachers as well as determine subjects for students' level (Tyson, 1997; Park, 2005). Textbooks are basic educational tools that subjects in the curriculum and objectives related to subjects are explained in them regularly. Moreover, they offer teaching methods to teachers and direct students according to course's objectives (Ogan-Bekiroğlu, 2007; Ünsan and Güneş, 2003). In addition to this, they play important role for students to link the relation between subjects mentally, learn subjects individually, repeat their knowledge, evaluate themselves and complete the lack of self-assessment. A textbook is an appropriate educational tool when it is prepared in accordance with course's objectives and at the same time its internal and external structure should be designed its aim (Aslan and Polat, 2008). Well prepared textbooks provide regular education with its subject order, evaluation questions that are suitable for students and activities. Nakipoğlu (2009) stated that textbooks which are published in science education can be used as laboratory manual by teachers and students since they include laboratory activities and studies. Generally two dimensions are thought during textbook evaluation. Firstly, the content analysis is used and secondly the evaluation of textbook visually is used (Eşgi, 2005). Appearance, color, information in textbook, size and font size are important for visual evaluation. The content which is the one of the important elements of the textbook should be appropriate instructional design principles. When the content is thought that a textbook should be compatible with objectives, a textbook should allow students to access information, put the students into learning center and be expressed for students. Textbook's content should progress from simple to complex, from easy to hard, from concrete to abstract and follow a chronological order (Küçükahmet, 2004).

#### 1.1. Statement of the Problem

In order to gain students scientific attitudes, comprehend the changes in science and technology, science education textbooks should be examined and necessary adjustments should be done. Aim of the present study is to determine teacher opinions about 5<sup>th</sup> grade science education textbook which depend on curriculum that was implemented in 2013. The problem statement of the study is that "What do teachers think and what is their view about the textbook?"

## **2. METHOD**

### **2.1. Research Model**

Qualitative data of the study were gathered via a form, which is composed of open-ended questions. The data was analyzed using descriptive analysis method. In descriptive analysis, relationship between data is expressed in a systematic way and by this way the result is expressed (Yıldırım and Şimşek, 2011). Study group of the study was comprised of 22 5th grade science education teachers who work in 5 different cities that are Aydın, Zonguldak, Bartın, Kayseri, Konya depending on maximum variation sampling method.

### **2.2. Data Collecting Method**

Semi-structured interview method has been used in receiving the opinions of 5th grade science education teachers. To create the form for data collection tool which included seven open-ended questions literature (Atmaca et. al., 2008) was examined and field experts were consulted. The form was arranged according the experts' opinion again and the last version of the form was composed. Semi-structured interview method was used in the study. The questions in the form are: The questions which are related to objectives and scientific content are:

What is the degree for gaining objectives in the curriculum which has been published since 2012-2013 academic year?

What is your opinion about the level of activities in the textbook consistency with objectives?

What is your opinions about measurement and assessment activities in the textbook that do they measure the objectives effectively?

The questions which are related to language and expression are:

What is your opinion about the consistency between concepts and number of these concepts in the textbook and students' level?

What is your opinion about the degree of correlation between themes and subjects and daily life and students' social life?

The questions which are related to visual design are:

How do you evaluate the activities in the textbook in terms of diversity such as image-shape, photos and puzzle and the consistency with student level?

What is your opinion about the consistency between visuals and texts?

Before conducting the study, the textbook was examined by the researchers and teachers' opinions were quoted as they were and teachers were coded as P1, P2. The present textbook was examined according to "Textbooks and Instructional Tools Regulation" that was published by Ministry of Education in 2012. The regulation indicates that:

A textbook must obey the constitution and laws.

A textbook must obey basic human rights. Moreover a textbook does not contain any discriminatory for gender, religion, language, color, political opinion, philosophical belief, sect etc.

A textbook must be prepared in terms of scientific principles and methods.

A textbook do not contain any advertisements.

## **3. FINDINGS**

### **3.1. Findings Related to Scientific Content and Objectives**

The related textbook consists 7 units which are respectively "Let's Solve The Puzzle of Our Body (13 objectives)", "Measurement of Force Size (2 objectives)", "Change of Matter (20 objectives)", "The Spread of Light and Sound (24 objectives)", "A Journey to Living Beings (3 objectives)", "Electricity: Irrevocable for Our Life (3 objectives)", "The Mystery of Earth's Crust/ World and Universe (10 objectives). Aim of the textbook is to achieve totally 44 objectives during 144 hours (MEB, 2013).

When the textbook was examined in terms of objectives in the curriculum there is inconsistency for some objectives and even though some objectives are not in the curriculum, they are included in textbook. For example, it was found inappropriate in Unit 4 whose name is that "The Spread of Light and Sound" that there was a comparison for the light and sound spreading.

When the textbook was examined in terms of activities that using tools which are used in experiment and activities is not consistent with student level. The activities can be reduced to simple way in accordance with 5th grade students' psycho-motor skills. Tools or equipments that are used in the activities may be dangerous for students such as matches, sewing needles, various chemicals etc. In the first unit which was "Let's Solve The Puzzle of Our Body" there is "screwdriver" however in the activity there is no knowledge about the where it is used. Activities in the 3rd unit "Change of Matter" includes many chemicals such as pure alcohol, pure acetone. Instead of these chemicals or materials which are used in the daily life may be selected.

The same unit at an event that is present within the "gravzant ring" is to take place is not very suitable to the level of knowledge of students. Activities included in the program is appropriate to the level of the students in line with the gains made can be increased the applicability.

When asked about the book examined teachers, practitioners; teachers generally consider that it covers the book's achievements. But P1 coded teacher, in "Nutrients and properties" unit "Water and minerals are found in foods makes all infer that your reasoning for the (5.1.1.3) " gain realization of stated that difficult. "Cigarette and alcohol use also damage to the body based on research data discusses with regard to recovery (5.1.1.6) "*simply an internet page and there is no student can investigate the events,*" he said.

P4 is the unit "in our bodies excretory" coded teacher "The discharge officer structure and organs allows only for the (5.1.3.1)" gain was talking about only lungs and skin but not talking large intestine and liver. P1 coded teacher, gain that "research and presents what should be to protect the health of the kidneys "with regard to recovery still being just as renal excretory organ of other organs be creditworthy and warranted.

P7 coded teacher is said unit that "Getting to know the creatures" "Microscopic organisms (bacteria and protozoa) and toadstool is provided but not entered into the structural detail to examples (5.5.1.1. b)" acquisition "in relation to the *Microscopic organisms not called bacteria*" uses the phrase.

P12 teacher is said that activity contained in the coded number of the theme in general by increasing the gains can be performed in a manner that is more objective. P18 coded teacher is stated in terms of suitability of the achievements of the activities "*increasing the efficiency and the diversification of experiments and number of visual learning is important in terms of*". P22 teacher coded is stated that activities can be diversifying according to the lower rungs and numbers of activities fail.

Measurement and evaluation in terms of goals with events book examined the different measuring type is seen to have been given to questions (branched tree, concept map, puzzle,...). But students can do in cooperation with the project because it does not have adequate levels of observed. Students can do as a group activity with events, projects can be increased and perform daily life activities, also included is the Internet. In addition, individual students and peer review can do sections can be added to the book.

P15 coded teacher is stated as related to the teacher assessment and evaluation "*measurement and evaluation of cognitive processes in children in supporting more questions and experiments can be*", P16 coded teacher is stated "*Children requiring them to work as a group in project, and can be given more space to work*" in the same way P17 coded teacher is "*I think that should be supported with the projects and more questions*" and P18 coded teacher is said "*We could increase the level of children's attention with more and different questions.*"

### **3.2. Findings Related to the Language and Expression**

When teachers' answers to open-ended questions were examined, the book's language level is appropriate to the level of the students but annotations is needed that some of the equipment used in the activity (Gravzant ring, with cutting it..). It is said that book activities in daily life to the extent that students can relate is descriptive. Especially in "Change Item Unit" is located on the activities from be told as more descriptive and should relate to the everyday

life of the materials used. 6th unit is "indispensable of our lives: electricity" descriptive information about the Edison about students by concept therefore is considered to be cause of misconception. Electricity is directly related to the place to meet scientists and therefore is considered to be more appropriate.

Textbook are related to everyday life. In this regard, P5 teacher is stated example of "writing about the unit, while eating, while carrying our bags, bicycle when using objects force we depend" related to "measurement of the size of the force unit" and "*Boiling milk or broth to the mix we use metal spoon after a while, we feel the heat burning into our hands*" gives the sentence relation to the "The Exchange Materials Unit".

P13 coded is stated that the concepts appropriate for the theme but can be increased of the number of each theme refers to the concept. P14 teacher is said that expressions can take part in such a way that even more descriptive concepts can be explained in parentheses indicates. P15 coded is said in relation to the concept in the book the teacher that "*Concepts more focusing on the attention the child be available with subtitles and can be provided to learn easier*". P18 teacher is stated concrete expression should be for the concept.

P20 coded teacher is stated that about up-to-date information "I think that the book should be reorganization and the information should be rich". He/she is said the concepts of some issues won't be recall. P21 coded teacher is said that students cannot take advantage of experiments in the book in everyday life because environment do not fit. He/she is said some of the concepts were wrong in the book because of the lack of information indicates.

### **3.3. Findings Related to Visual Design**

Some textbooks are designed according to "they are not contain items for advertising material", "visual design and content design development of supportive learning and students' development process", "They are prepared in accordance with basic design principles according to published in 12.09.2012, on the Official Gazette (28409) article 6. (Official Gazette, 2013).

There is as an exception to this articles in his book lessons that first unit is "we solve our body mystery of the topic' cigarette' visual is so clearly there is not appropriate.

Titled "Variables that affect full shadow" located in fourth unit "Spread the light and sound" drawings are not understand clearly when looking at light source's adduction or remove to object.

This part should be as a real experiment visually as described; not drawing thus it easy meaningful learning and students association provides everyday life makes.

Teachers are stated that lesson book appropriate in term of visual elements for level of students.

We wanted to teachers that they found points of insufficient or incorrect in the book and opinions from a teacher;

Subject related to technology should be expand and updated,

The book should be updated and subject of unknowns' about space should be included.

## **4. CONCLUSION**

In this study, Science Education Course Book and related book's visual presentation and content critically was examined in the light of science and technology teachers' feedback. At the present time, textbooks appear to be the most frequently teaching materials in schools. The student repeat to learned in school lessons and he/she can learn knowledge herself, textbooks have great importance. However, students can learn the lesson from the book alone for understanding; it is not possible to read the text easily.

The main target of a textbook prepared in accordance with the purpose and objectives specified in the curriculum is guided to students facilitate the reaching of knowledge and to guiding them towards achieving knowledge. It is important to evaluate textbooks prepared according to specific criteria from this point of evaluation. Textbooks are used after approval by the Ministry of Education in India. When the findings obtained from this study were examined, 5th grade textbook is seen that there are some issues that need to be updated.

Teachers have similar thoughts about that it is appropriate to comply with the achievements of the book but in terms of content, teachers want workbook. In order to reinforce the topics learned according to the teachers' opinions are needed more activity. It would not be appropriate to use a different source outside, providing more

knowledge and activity locations is recommended to gains specified in the program countervailing. In addition to textbooks that student's workbooks considered for inclusion. Given the importance of textbooks in terms of learning, it is important to do the necessary updates according to findings obtained.

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