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**Original article**

## **Analysis of the content of 6<sup>th</sup> grade math book based on William Rummy technique and bloom cognitive categories**

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**ABSTRACT**

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The aim of present paper is to investigate and analysis of the content of activities, text and images of 6th grade math book in 2013 based on William Rummy and analysis of activities, exercises and problems according to Bloom cognitive categories. The method used in this research is content analysis. Statistical community of the work is the 6th grade math book published in year 2013. Results of research demonstrated that engagement coefficient of activities, text and images are 0.85, 1.5 and 1.85, respectively which implies that these parts of math book are written in an active manner. Engagement coefficient of images as much as 1.85 shows that images of the book engages the student in learning process. Moreover, engagement coefficient of exercises is determined to be 1.2 which shows that exercises are written in an active manner. Furthermore, in part of analysis of activity based index, engagement activity is determined to be 0.85 which shows that the book is activity based. In part of analysis based on Bloom cognitive categories, it is found out that 79.68% of activities and exercises of the book are in the level of understanding, 16.60% are in the level of application and 2.63% are in the level of analysis. This analysis showed that within book, number of exercises, activities and problems in the highest level of recognition category are limited.

## 1. Introduction

Educational book is a learning tool. Therefore, it must follow learning logic and is one of the most essential sources of learning in educational systems. The more the book content is related to essential and general needs, the higher the motivation for learning will be (Maleki, H., 2011).

By providing a definition of educational book and learning material, UNSECO (2005), explains its position and role in learning: "educational book is a learning tool which is designed for achieving a certain set of educational goals and is comprised of text, image and text and image and traditionally is a published set which navigates facilitation of learning chain. Learning materials are any type of media which support learning plan and are often used for assisting educational book. Some of these materials are: workbooks, diagrams, educational games, vocal and video tapes, posters and reading assistance texts. (Nourian, M., 2008)".

Including various information in educational books, memory growing strategy, shallow learning, inactive content, ignoring applicability of educational book content and overemphasizing score, are always main problems faced by educational system of our country. In educational systems, in which the main goal is to improve students' scores, what is necessary for them to learn is neglected (Karami, et.al, 2013). One of the problems is presenting written content which is prepared and presented in the form of concepts, rules and laws comprising the various parts of content. In traditional plans in which psychological principles and educational planning were less considered, this type of providing content was dominant while in addition to written form, content can be provided in other forms (Maleki, H., 2010, p. 74). Selecting beautiful pictures and images related to prepared content and concepts, is an alternative. In elementary period in which learning is carried out visually, using photos and images are more effective. Of course, images and photos must be chosen carefully since sometimes chosen photo may not be related to other contents and may not help learning. Educational planning environment is learning one. Therefore, photos and images must be supportive of each other and facilitate the achievement of educational goals (Maleki, H., 2010, p. 74).

Content of educational plan is important with regard to its role in achieving goals. Since planning, edition, alteration and updating educational books are necessities of educational systems, analysis and investigation of them has significance. Such analysis helps editors of educational books to take care when editing, selecting and preparing educational content so that they can facilitate learning as well as promoting students' educational progress. In fact, content analysis helps to scientific investigation of concepts, principles, views, beliefs and all parts of educational books (Yar mohammadian, M. H. 2002).

In recent decades, math learning plan in elementary schools has changed significantly. Such changes are impressed by suggestions of psychologists such as Burner, that is, modification of educational plans must be based on the structural analysis of that subject so that its various parts as well as concepts and keywords which are frequently used to organized and create meaning of information are determined (Taghi Pour Zahir, 2010, p. 117). Taking into account the content of mathematics, it is necessary for students to understand the mathematics and be strong in utilizing essential logical tools (Taghi Pour Zahir, 2010, p. 120). For this reason, it is better to include problems in educational books which are taken from environment and be related to real life so that students consider them as real problems and valuable for solution and try to solve them (Taghi Pour Zahir, 2011, p. 83).

With regard to math book content analysis, due to new edition of book, there is no research done in this field. We hope to see such analyses in future. According to importance of the issue and the role of educational book content in motivating, promoting appropriate activities and facilitating students' learning and determination of teaching method, in this work, content of 6th grade math book has been analyzed based on William Rummy and Bloom cognitive categories. In this research, concepts of content analysis, William Rummy and Bloom cognitive categories are applied. The purpose of this work is to analyze text, activities, homework, exercises, images and problems of 6th grade math book according to

William Rummy technique and analysis of activities, exercises and problems based on Bloom cognitive categories.

## 2. Research method

In this work, content analysis based on William Rummy technique has been used. Our statistical community includes 6th grade math book published in 2013. Selected sample in text analysis part covers 35 pages of chapter 8 of the book and in each chapter, 25 sentences were analyzed and coded successively. In images part, 20 pictures were selected randomly from all of the book and all chapters. In part of activities, 20 pages were selected randomly and activities were counted. Our research community in the part of activities was based on the goals of Bloom cognitive categories and covered all exercises, activities and problems of the book so that from each topic, a sample for exercise and activity were selected and the level of each one was determined by means of Bloom cognitive categories. To analyze information in William Rummy technique, formula provided by William Rummy has been used.

### 2.1. Research questions

1. Is the text of 6th grade math book written in an active manner based on William Rummy?
2. Do images of the book engage the learner?
3. Is the text of 6th grade math book written based on William Rummy activity based?
4. How many percent of the exercises, activities and problems are in accordance with the level of knowledge, understanding, application, analysis, combination and evaluation of Bloom cognitive categories?

## 3. Research findings

According to research findings, number of active topics in the book are 129 and passive ones are 72 items which shows that the ratio of active to passive items is high within investigated pages. Based on the formulation of engagement coefficient in William Rummy pattern, number of active items was divided by passive ones and engagement coefficient was calculated to be as much as 1.79. This coefficient shows that the text of math book is written in an active manner. However, the level of engagement with text is in a high level.

Number of active images of the book was 13 and passive ones was 7 which illustrates that the number of active images is higher compared to passive ones. According to the formulation of engagement coefficient in William Rummy pattern, number of active images was divided by passive ones and engagement coefficient was calculated to be 1.85. This coefficient shows that images of this book are prepared in an active manner and engagement coefficient is appropriate as well.

Number of activities in sample pages was counted and divided by the number of pages. In 20 investigated pages, there were 15 images. Results of table 3 shows that engagement coefficient is 0.85 illustrating that the math book is activity based.

According to Bloom cognitive categories, 6.06% of exercises, activities and problems are in knowledge level, 79.68% in understanding level, 11.06% are in application level and 2.63% are in analysis level. In the level of combination and evaluation, there was no exercise or active problem included in sample pages. These findings imply that in preparation of exercises, activities and problems of the book, higher levels of cognitive categories are less considered.

## 4. Conclusion and discussion

The purpose of this research is to analyze the content of 6th grade math book based on William Rummy pattern and Bloom cognitive categories. Engagement coefficient of book was evaluated to be as much as 1.79. Therefore, based on interpretation of results in Rummy pattern, it can be concluded that the book, engages learners in learning process and the text of the book is written in an active manner. Engagement coefficient of the images is 1.85. As a result, based on the results interpretation, we can

conclude that images of the book can engage learners in learning process. The reason for high engagement coefficient is that majority of the images used in the book require mental engagement and are included for the sake of activity. Therefore, we conclude that images play an important role in educational books and it is necessary for editors to use not only images to transfer information and used them for the sake of engaging students in learning process as well. This results illustrates the role of images in educational books and also they state that in teaching, images and their roles in active learning must be taken into consideration.

In activity part, engagement coefficient is found to be 0.85 and according to interpretation of results based on Rummy pattern, it can be inferred that the book is generally activity based. Being activity based is the reason for that the number of predicted activities in investigated sample compared to overall volume of the sample is sufficient. However, to increase the engagement coefficient, it is necessary that further activities are included in the book and at the same time, the volume of the content are decreased. By lowering the content of the book and increasing the activities, we can have a more appropriate book.

79.68% of exercises, activities and problems of the book are in the level of understanding of Bloom cognitive categories and higher level which is necessary for mental development of students is less considered.

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