

Analysis of the Content of Iran's Fourth-Grade Textbooks Based on the Level of Attention to Green Management Components

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(Received: 30.03.2022

Accepted: 21.06.2022)

تحلیل محتوای کتاب‌های درسی پایه چهارم ابتدایی ایران بر اساس میزان توجه به مؤلفه‌های

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(پذیرش: ۱۴۰۱/۰۳/۳۱)

(دریافت: ۱۴۰۰/۰۱/۱۰)

Abstract

Nowadays, due to the growing process of global warming, increase of greenhouse gases and reduction of natural resources, environmental crises are more than ever before, therefore one of the topics that has attracted a lot of attention in educational systems is to present new attitudes of conservation. Environment is in education, which is considered one of the important tasks of the educational system and is applied in educational books. Considering the importance of the environment, the purpose of this research is to analyze the content of fourth grade textbooks based on the level of attention paid to green management components. The research method is descriptive and qualitative and quantitative content analysis, which analyzed the data using Shannon's entropy technique. The statistical population of the research includes social studies, Farsi and experimental science books of the fourth grade of elementary school, which due to the nature of the subject, sampling was not done and all the statistical population was examined. and the research tool in this research is a checklist and based on the report of the technical and research office of the "Green Management Steering Center", the indicators of green management in several main areas including energy management, water and wastewater management, benefit from renewable energy, waste management, pollution control Sound, transportation and the spread of culture and strengthening of social responsibilities in the field of environment, the selected books were studied according to these components. The obtained results showed that the highest coefficient of indicators related to green management for the fourth grade social studies course was for the index of energy management and use of renewable energy, respectively. For the Persian course, water and sewage management had an importance coefficient of 0.26, and for the experimental science course, water and sewage management, use of renewable energy, noise pollution control and transportation, energy management and promotion of culture and environment had an importance coefficient of was 0.17.

Keywords: Content Analysis, Green Management, Textbook, Fourth- Grade.

چکیده

امروزه به دلیل روند روبه رشد گرم شدن زمین، افزایش گازهای گلخانه‌ای و کاهش منابع طبیعی، بحران‌های زیست‌محیطی از هر زمان دیگری بیشتر است. از این رو یکی از موضوعاتی که امروزه توجه بسیاری را در نظام‌های آموزشی به خود جلب کرده است، ارائه نگرش‌های نوین حفظ محیط‌زیست در تعلیم و تربیت است که از وظایف مهم نظام آموزشی محسوب می‌شود. با توجه به اهمیت محیط‌زیست هدف از این پژوهش، بررسی تحلیل محتوای کتاب‌های درسی پایه چهارم ابتدایی بر اساس میزان توجه به مؤلفه‌های مدیریت سبز بود. روش پژوهش، توصیفی و از نوع تحلیل محتوای کمی آنتروپی شانون بود. جامعه آماری پژوهش شامل کتاب‌های مطالعات اجتماعی، فارسی و علوم تجربی پایه چهارم ابتدایی بود که با توجه به ماهیت موضوع نمونه‌گیری انجام‌نشده و همه جامعه آماری بررسی شده است و ابزار پژوهش در این پژوهش چک‌لیست بود و با استناد به گزارش دفتر فنی و پژوهش‌های «مرکز راهبری مدیریت سبز»، شاخص‌های مدیریت سبز در چندین حوزه اصلی شامل مدیریت انرژی، مدیریت آب و پساب، بهره‌مندی از انرژی‌های تجدیدپذیر، مدیریت پسماند، کنترل آلودگی صوتی، حمل‌ونقل و رواج فرهنگ و تقویت مسئولیت‌های اجتماعی در حوزه محیط‌زیست، کتاب‌های منتخب بر اساس توجه به این مؤلفه‌ها مورد مطالعه قرار گرفتند. نتایج به‌دست‌آمده نشان داد که بالاترین میزان ضریب شاخص‌های مرتبط با مدیریت سبز برای درس مطالعات اجتماعی پایه چهارم به ترتیب برای شاخص مدیریت انرژی و بهره‌گیری از انرژی تجدیدپذیر بود. برای درس فارسی، مدیریت آب و پساب با ضریب اهمیت ۰/۲۶ بود و برای درس علوم تجربی به ترتیب مدیریت آب و پساب، بهره‌گیری از انرژی تجدیدپذیر، کنترل آلودگی صوتی و حمل‌ونقل مدیریت انرژی و ترویج فرهنگ و حوزه محیط‌زیست با ضریب اهمیت ۰/۱۷ بود.

واژه‌های کلیدی: تحلیل محتوا، مدیریت سبز، کتاب درسی، پایه

چهارم ابتدایی.

Introduction

In today's world, management is considered a science that needs new approaches in accordance with the progress of human knowledge. The contemporary century is a period in which humans are trying more and more to reach the unknowns in the world. More effort means development, and it requires the use of God-given resources. It is evident that if the exploitation of these resources is not performed consciously and based on the concepts of sustainable development, there will be no result other than the destruction of these resources. Sustainable development is discussed in all fields, which includes economic, political, social, and environmental issues. Thus, only paying attention to the environment in the development plan does not mean sustainable development, one of the results of sustainable development is attention and action to environmental protection. That is why new words such as green management, green productivity, and green government have appeared in the management system in the last few years (Yu et al., 2021).

Due to the inseparable and close relationship between environment and development, it is necessary to minimize damage to the environment caused by development via obtaining and using management tools. Also, it is evident that one of the effective factors in management, especially green management, is to institutionalize environmental ethics and reach all sections of society and officials to it. In fact, green management is the environmental performance of organizations, organs, and companies in a way that leads to the reduction of energy and water consumption, low unnecessary consumption, the modification of the consumption pattern, and the optimal use of resources in the above devices (Li et al., 2021). In recent years, much attention has been paid to green management programs; also, most countries have taken steps for a green business to be effective in the process of saving and preserving the country's natural resources. It can be said that the protection and development of natural resources is the biggest challenge in developed countries (Peng et al., 2008). In fact, from the point of view of sustainable development, creating suitable platforms for

improving productivity, quality, competitiveness, creativity, and innovation in the optimal consumption of materials and benefiting from a favorable environment along with economic and social growth indicators can be achieved through the establishment of a green management system at the country level and finally enabling to implement the green government (Li et al., 2021).

To preserve and survive the environment, society should have appropriate knowledge and attitude so that they can behave harmoniously and adapt when facing the issues that affect the environment's health. Education related to the environment should be given to people in childhood to institutionalize these behaviors in individuals because experts believe it is better to start the necessary environmental education from an early age. Undoubtedly, children who undergo organized education indicate a correct and wise reaction when faced with human-caused problems in the environment (Bashir Eskooi et al., 2014).

Education refers to all the activities planned by the teacher to facilitate learning with an individual view of teaching and learning, and flow between the teacher and one or more learners in the form of interaction. This approach has a strong background and relies on tried and tested methods, plans, and experimented curricula (Baker, 2021). The starting point of attention and development of a sense of environmental responsibility is childhood, and elementary school. Since education in every country is the most influential source, textbooks and stories at these ages will be most effective for learning and creating environmental behavior in children, as they regularly acquire knowledge and understanding about the social environment, environment, environmental problems, and the use of environmentally friendly products, and communicates with it children through mental criteria, formal education and the content of textbooks. According to Karatekin et al. (2012), it is worth noting that the green management and environmental components are issues examined in a set of desirable social behaviors; that is, those behaviors that should be taught to children in the form of books not only to improve the attitude and behavior of

students; but also to strengthen the ability to recognize, describe, and invent new methods to deal with environmental problems and sense of responsibility, since good environmental behavior is a function of environmental responsibilities, so the curriculum planners are not satisfied with only one specific lesson and include this issue in other books. Since the content of elementary school textbooks is one of the most important means of recognizing and teaching students' environmental behaviors, lesson planners must consider them in formulating educational goals and designing books. According to the mentioned cases, it can be concluded since the content of the books (vocabularies, words, sentences, shapes, and images) of the elementary course are the most important tools for recognizing and teaching environmental behaviors to students, the curriculum planners must prepare educational goals, and consider the design of textbooks for the components of green management and care of resources. The components of green management contain energy management, water, and wastewater management, use of renewable energy, waste management, noise pollution control, transportation, and promotion of culture and environment.

Examining and analyzing the content of the fourth-grade books of the elementary course in terms of attention to green management is the purpose of this research. Among the 7 books of the fourth grade of elementary school, three books on Social Studies, Farsi, and Experimental Sciences were selected because their content is the closest to green management and more material is written about the unfavorable effects of the environment due to incorrect consumption. Therefore, these books were selected. In this research, the amount of reflection has been raised on this question the content of social studies, Farsi, and experimental science books of the fourth grade of elementary school to what extent have addressed the components of green management? Undoubtedly, the results of this research can help those involved in curriculum planning in the following editions of this book.

In reviewing the background of the research, some research in this field has been carried out under the title of environmental content analysis, such as Puspitasari et al. (2021), research entitled attention to environmental

issues in the English language textbook. The finding of this research showed that helping to preserve the environment, and being friendly and tolerant of the environment are the most important environmental moral values that are shown in discourse in three English language textbooks, English workbooks, and elementary English grammar in the present study. Tahmasabi et al. (2020) conducted research titled "*Content Analysis of Environmental Behaviors and Attitudes in 4th to 6th Grade Social Studies Books*". In this research, the number of environmental components was 37 components in the fourth-grade social studies book, 29 components in the fifth grade, and 82 components in the sixth grade. Among the examined components, the highest repetition rate in texts and images is related to the examples of the category of environmental responsibility. Fazeli&Mahdavi Ikdalo (2019), in their review entitled "*Investigation of the Status of Environmental Content in Experimental Science Textbooks of the General Education Period*", concluded that the most attention in the experimental science book of the seventh grade and the least attention in experimental science books of the third elementary school are related to environmental problems. In general, in experimental science books, the most attention has been paid to the role of humans in the environment and the least attention to noise pollution.

Shaisteh et al. (2018), in their research entitled "*The Amount of Attention paid to the Components of Environmental Education in the Experimental Sciences Books of the First-grade of Elementary School and the Considerations of Using it in the School Curriculum*", 15 conceptual components about environmental education extracted from authentic books using the document analysis method. The findings showed that a total of 185 first-grade science books mentioned the components of environmental education. Low frequency in some components was far from expected. Therefore, the planners and authors of textbooks are expected to keep these things in mind. Marcos Miguel (2015), in his research entitled "*Pattern of Consumption in Textbooks*", showed that environmental adaptations were emphasized in the activities in educational textbooks, but they differed in each curriculum in terms of quality.

Research Methodology

The methodology of this research is applied in terms of purpose and descriptive in terms of content analysis, and it was carried out using *Shannon's* entropy technique.

The statistical population of this research is all the fourth-grade books as follows. Among the 7 books of the fourth-grade of elementary school, three books on social studies (166 pages), Farsi (160 pages), and experimental sciences (129 pages) were selected because their content is the closest to the concept of green management and more materials are presented about the negative environmental effects caused by incorrect consumption. To collect data in this research, document patterns and content analysis were used. A researcher-made checklist was used in the content analysis, and thorough the theoretical study, analysis of documents, research background, and by asking the opinion of 12 experts, the following seven indicators were considered for the examination of green management:

- Energy control
- Water and sewage management
- Use of renewable energy
- Waste management
- Sound pollution control
- Transportation
- Promotion of culture and environment

The "*Holistic*" method was also used to check the reliability of the results. In this

method, items are numbered in two steps. *Holistic* has provided a formula for determining the reliability of nominal information in terms of the "observed degree of agreement":

$$PAO = 2M \cdot (N1+N2)$$

In the above formula, M is the number of common numbering items between two coders, and N1 and N2 are the numbers of all items coded by the first and second coders, respectively. The PAO value is between zero (no agreement) and one (complete agreement) and is reasonable if it is greater than 7.0. The *Holistic* coefficient calculated in this research to check the reliability of the content analysis results of Persian and Social Studies books was 0.8 and the Experimental Sciences book was 0.85, which has been favorable in this order.

The quantitative and descriptive Shannon entropy method was also used to analyze the resulting data. To calculate Shannon's entropy, referring to Azar (2010), it was carried out as follows:

$$K=1/\ln(m)$$

$$E_j=-k\sum [p_{ij}*\ln P_{ij}]$$

$$W_j=d_j/\sum d_j$$

Research Findings

First question: How much attention has been paid to the components of green management in the fourth-grade social studies textbook?

Table 1. Frequency Distribution of Indicators Related to Green Management in the Fourth-Grade Social Studies Book

	Energy Control	Water and Sewage Management	Use of Renewable Energy	Waste Management	Sound Pollution Control	Transportation	Promotion of Culture and Environment
our neighbor	0	0	0	0	5	0	0
This is our neighborhood	0	1	0	1	1	0	2
Shopping in the neighborhood	0	0	0	0	0	0	0
Map of our neighborhood	0	0	0	0	0	1	1
Life in the city and the countryside	0	0	0	0	0	0	0
Geographical directions	0	0	0	0	0	0	0
How do geographers study living environments?	0	0	0	0	0	0	0
How were the first villages created?	1	1	1	1	1	1	1
How were the first cities created?	1	1	1	1	1	1	1
How do historians study the past?	0	0	0	0	0	0	0
A trip to Persepolis (1)	0	0	0	0	0	0	0
A trip to Persepolis (2)	0	0	0	0	0	0	0

	Energy Control	Water and Sewage Management	Use of Renewable Energy	Waste Management	Sound Pollution Control	Transportation	Promotion of Culture and Environment
A trip to the ancient city of Kermanshah	0	0	0	0	0	0	0
Beautiful mountains and plains weather	0	0	0	0	0	0	0
Climatic regions of Iran	0	0	0	0	0	0	0
Vegetation and animal life in Iran	0	0	0	0	0	0	1
Take care of the environment	1	1	1	1	1	1	1
Our national symbols	0	0	0	0	0	0	0
Calendar	0	0	0	0	0	0	0
important days	0	0	0	0	0	0	0
Total	3	4	3	4	9	4	7

The data in Table.1 shows that in the frequency distribution of indicators related to green management in the social studies book, energy management had 3 repetitions; water and sewage management 4 repetitions; using renewable energy 3 repetitions; waste management 4 repetitions, noise pollution control had 9 repetitions, transportation 4 repetitions, and promotion of culture and environment 7 repetitions. According to the obtained results, it can be said that in the fourth-grade social studies book, the noise pollution control component has been given the most attention, and this component has been the most emphasized in the first lesson.

In the following, the normalized data of indicators related to green management have been calculated and discussed according to the following formula:

$$P_{ij} = a_{ij} \cdot \sum_{i=1}^n a_{ij}$$

The values of the constant coefficient k were calculated considering that the fourth-grade social studies book contains 22 lessons:

$$k = 1 / (m) = 1 / (22) = 0.323$$

The entropy value has also been calculated for each index:

$$E_j = -k \sum [P_{ij} \ln P_{ij}]$$

$$W_j = d_j \cdot \sum d_j \text{ which here is } d_j = 1 - E_j$$

Table 2. Information Load and Importance Coefficient of Indicators Related to Green Management in the Fourth-Grade Social Studies Book

Promotion of Culture and Environment	Transportation	Sound Pollution Control	Waste Management	Use of Renewable Energy	Water and Sewage Management	Energy Control	
0.39	0.34	0.34	0.34	0.24	0.34	0.24	Ej
0.61	0.66	0.66	0.66	0.76	0.66	0.76	Dj
0.15	0.16	0.16	0.16	0.18	0.16	0.18	wj

Based on the results listed in Table. 2, the highest value of the importance coefficient of indicators related to green management for the fourth-grade social studies course included the indicators of energy management and use of renewable energy with an importance coefficient of 0.18, water and wastewater management, waste management, noise

pollution control and transportation with an importance coefficient of 0.16 and promotion of culture and environment with an importance coefficient of 0.15, respectively.

The second question: To what extent has green management been paid attention to in the Persian textbook of the fourth grade?

Table 3. Frequency Distribution of Indicators Related to Green Management in the Fourth-Grade Persian Book

	Energy Management	Water and Sewage Management	Use of Renewable Energy	Waste Management	Noise Pollution Control	Transportation	Promotion of Culture and Environment
Creator of beauty	0	0	0	0	0	0	0
The migration of swallows	0	0	1	0	1	0	1
The secret of signs	0	0	0	0	0	0	0
The value of science	1	0	0	0	0	0	
Release from the cage	0	0	0	1	0	1	1
Archer Arash	0	0	0	0	0	0	0
Guest of our city	0	0	0	0	0	0	0
kindergarten	1	1	1	1	1	1	1
The commander of hearts	1	1	1	1	1	1	1
Simple event	0	0	0	0	0	0	0
God's favor	1	0	0	0	0	0	0
Where did you learn politeness from?	0	0	0	0	0	0	0
lion and mouse	0	0	0	0	0	0	0
Total	4	3	3	3	3	3	4

The data in Table 3 shows that in the frequency distribution of indicators related to green management in the fourth-grade Persian textbook, energy management had 4 repetitions; water and sewage management 3 repetitions, use of renewable energy 3 repetitions; waste management 3 times; noise pollution control 3 repetitions, transportation 3 repetitions, and promotion of culture and environment 4 repetitions. According to the obtained results, it can be said that the energy management component has been given the

most attention in the fourth-grade Persian book. In the following, the normalized data of the indicators related to green management have been discussed according to the relevant formula. The values of the constant coefficient k were also calculated considering that the Persian book had 13 lessons:

$$k = 1 / \ln(m) = 1 / \ln(13) = 0.39$$

The entropy value has been calculated for each index:

$$E_j = -k \sum_i [P_{ij} \ln P_{ij}]$$

$$W_j = d_j / \sum D_j \text{ which here is } d_j = 1 - E_j$$

Table 4. Information load and importance coefficient of indicators related to green management in a Persian book

Promotion of Culture and Environment	Transportation	Sound Pollution Control	Waste Management	Use of Renewable Energy	Water and Sewage Management	Energy Control	
0.54	0.43	0.29	0.43	0.43	0.00	0.54	E_j
0.46	0.57	0.71	0.57	0.57	1.00	0.46	d_j
0.12	0.15	0.18	0.15	0.15	0.26	0.12	w_j

According to the results of Table. 4, the highest value of the importance coefficient of indicators related to green management for the fourth-grade Persian textbook is for water and sewage management with an importance coefficient of 0.26, and the lowest value of the importance coefficient is for the indicators of

energy management, promotion of culture and environment with a significance coefficient of 0.12.

Question 3: To what extent have green management components been paid attention to in the fourth-grade experimental science textbook?

Table 5. Frequency Distribution of Indicators Related to Green Management in the Fourth-Grade Experimental Sciences Book

	Energy Management	Water and Sewage Management	Use of Renewable Energy	Waste Management	Noise pollution Control	Transportation	Promotion of Culture and environment
Science time	1	0	1	0	0	0	0
Mixtures in life	1	1	0	0	0	0	1
Energy, our daily need	1	1	1	1	1	1	1
electrical energy	1	0	1	0	1	0	1
Heat and matter	1	0	0	0	0	0	1
stones	0	0	0	1	0	0	1
Magnet in life	0	0	0	1	0	0	1
the sky at night	1	0	0	1	0	0	1
our body (1)	0	0	0	0	0	0	0
our body (2)	0	0	0	0	0	0	1
Invertebrates	0	0	0	0	0	0	1
Diversity of plants	0	0	0	0	0	0	1
habitat	0	0	0	0	0	0	1
Total	6		3	4	2	1	11

The data in Table 5 shows that in the frequency distribution of indicators related to green management in the book of experimental sciences, the promotion of culture and environment with 11 repetitions has received the most attention, followed by energy management with 6 repetitions, waste management with 4 repetitions, use of renewable energies with 3 repetitions, water, and sewage management and noise pollution control with 2 repetitions, and transportation with 1 repetition have received the most to least attention, respectively. According to the obtained results, it can be said that the most attention has been paid to the component of

promoting culture and environment in the fourth-grade experimental science book.

In the following, the normalized data of the indicators related to green management have been discussed according to the relevant formula. The values of the constant coefficient k were calculated considering that the fourth-grade experimental science book had 13 lessons:

$$k = 1 / \ln(m) = 1. (13) = 0/ 39$$

The entropy value has also been calculated for each index:

$$E_j = -k \sum [P_{ij} \ln P_{ij}]$$

$$W_j = d_j / \sum D_j \text{ which here is } d_j = 1 - E_j$$

Table 6. Information Load and Importance Coefficient of Indicators Related to Green Management in the Book of Experimental Sciences

Promotion of Culture and Environment	Transportation	Sound Pollution Control	Waste Management	Use of Renewable Energy	Water and Sewage Management	Energy Control	
0.05	0.00	0.00	0.03	0.00	0.00	0.02	E_j
0.95	1.00	1.00	0.97	1.00	1.00	0.98	w_j
0.16	0.17	0.17	0.16	0.17	0.17	0.17	d_j

Based on the results of Table 6, the value of the importance coefficient of indicators related to green management for the experimental sciences textbook are water and sewage

management, use of renewable energy, energy management, noise pollution control, and transportation with 0.17, the highest and the lowest value for waste management and

promotion of culture and environment are 0.16, respectively.

Conclusion

Referring to the report of the *Technical and Research Office of the Green Management Steering Center*, the indicators of green management in several main areas include energy management, water, and sewage management, use of renewable energy, waste management, noise pollution control, transportation and promotion of culture and strengthening social responsibilities were in the field of environment, and in this research, three textbooks of social studies, Farsi, and experimental sciences of the fourth-grade of elementary school were examined by the content analysis method from the perspective of attention to the green management components. The obtained results (Table 2) showed that the highest value of the importance coefficient of indicators related to green management for the fourth-grade social studies course included the indicators of energy management and use of renewable energy with an importance coefficient of 0.18, water and sewage management, waste management, noise pollution control and transportation with an importance coefficient of 0.16 and the promotion of culture and environment with an importance coefficient of 0.15, respectively.

Also, the results listed in Table 4 showed that the highest value of the importance coefficient of indicators related to green management for the Persian course included water and sewage management with an importance coefficient of 0.26 and the lowest value of the importance coefficient included the indicators of energy management, promotion of culture and environment with an importance coefficient of 0.12. Also, the results of Table 6 showed the highest value of the importance coefficient of indicators related to green management for the course of the experimental sciences including water and sewage management, use of renewable energy, noise pollution control and transportation, energy management, and promotion of culture and environment with an importance coefficient of 0.17.

Since the researcher did not find research that analyzed the content of the experimental science book of the fourth grade in primary school based on attention to green management, therefore, no research can be mentioned due to alignment.

Regarding that response to questions number 1 and 2, the analysis of the content of two Persian and social studies books showed that the promotion of culture and environment, despite the acceptable repetition, has a lower importance coefficient than other indicators; Therefore, it is suggested to give more importance to this factor in textbooks and make it bolder through the use of this index in the activities, images, and text of the book.

In response to question No. 2, the content analysis of the Persian textbook showed that good attention has been paid to water and sewage management, and teachers' teaching is also very important in this field. Therefore, the researcher suggests: that teachers should also pay attention to this factor while teaching and encourage students to save and use water properly. In response to question No. 3, the content analysis of the experimental sciences textbook showed that water and sewage management, use of renewable energy, noise pollution control, transportation, energy management, and promotion of culture and environment have received the most attention in this book. Therefore, it is suggested that teachers take fundamental steps to double this by conducting appropriate experiments. Also, with explanations about wind turbines, and cars charged by sunlight, students are motivated to study these issues and encouraged to use such energies.

Regarding the education of green management and paying attention to its cases in all aspects of being green should be considered by the authors of textbooks, the components of green management should be included in the content of the books in a balanced way, because their components are related to each other. So curriculum designers in the selection and organizing of lesson content, including text or images, should pay balanced attention to energy management, water and sewage management, use of renewable energy, waste management,

noise pollution control, transportation, and promotion of culture and environment.

Since green management is not limited to a specific book and is a mission that is given to the educational system in general and in all

courses; Therefore, it is suggested to future researchers to examine the level of attention to green management processes, its dimensions, and components in all elementary school textbooks in the form of content analysis.

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