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# Teachers' Perspectives on the Availability of Environmental Concepts in Jordanian Science and Social Studies Textbooks of Seventh Grade: A Comparative Study

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## Abstract

The study aims to explore the teachers' perspectives on the availability of environmental concepts in the Jordanian 7th-grade science and social studies textbooks. A measurement instrument consisting of (25) items was developed and distributed to a study sample of (228) male and female teachers. The results show a moderate degree of environmental availability concepts in science textbooks, as the concepts of natural environmental resources are ranked first, while the concepts of environment and population are ranked second. Concerning the concepts of environmental problems, they are categorized in the penultimate rank, while the concepts of cultural and environmental elements are ranked last place. The results also show a moderate degree of environmental availability concepts in social studies textbooks, as the concepts of cultural and environmental elements are ranked first, while the concepts of environmental problems are ranked in second place. With regard to the concepts of natural environmental resources, they are ranked in third place, and the concepts of environment and population are in the last place. Besides, the results indicate that there are no differences between the estimates of the study sample in the area of natural environmental resources and the instrument as a whole and there are differences between the estimates of the study sample in the area of environment and population in favor of science teachers. As a final point, there are differences between the estimates of the study sample in the areas of cultural and environmental elements and environmental problems in favor of social studies teachers.

**Keywords**: Environmental concepts, science and social studies textbooks.

## INTRODUCTION

The process of protecting the environment is a necessary requirement for the continuation of human life, as humans are the main driver in what happens to the environment and its protection. Environmental awareness has become a necessity to acquire the correct behaviors to deal with the environment, and a social need that affects every society in the world at its various levels and educational stages. Environmental awareness is also one of the effective means that help people in preserving and maintaining the components of their environment from all the risks that they cause directly or indirectly. The continuous and renewed increase in all scientific fields necessitates the human being to continue reading and learning to keep pace with the civilizational progress flowing towards the environment, where the humans and society bear great responsibilities focused on protecting the environment and benefiting from its resources like energy which has become the main concern for nations, especially with unpredictable fossil fuel prices, global warming, environmental aspects (Abu Shaban et al., 2021; Thor & Karlsudd, 2020; Omran, 2014).

For humans, the environment is the set of natural conditions that surround them (Qutaishat and Abu Ali, 2021). It is also the framework in which they live, which comprises soil, water, air, and what each of these three elements contains from all components, living organisms, and the various aspects of weather and climate that prevail in this framework with its elements such as heat, wind, rain, humidity and atmospheric pressure, and the mutual relations among these the elements (Al-Tarawneh, 2015).

Supported by scientific and technological progress according to the increase in their need for food and clothing, people, in turn, bring about environmental change and natural biological replacement. As a result of rapid developments in various fields, environmental degradation is gradually making its way to widening the circle of environmental problems. Despite the very important attempts and efforts made to protect the environment represented in enacting environmental legislation and policies, all environmental changes and problems are due to human abnormal behavior. Hence, understanding the environment, how to interact with it, protect it, and preserve it has become an urgent necessity (Erdogan, Bahar, & Ozel, 2012; Schild, 2016).

In this take and give discussion, the solution lies in helping the community members acquire environmental concepts, skills, and values and include them in the curricula and related topics in public education and higher education. The curriculum plays a prominent role in preparing the good citizen who carries a system of values such as active participation in preserving the environment, solving its problems, and rationalizing and investing environmental resources (Na`nah & Al-Kateeb, 2015).

Over time, the school was, is, and will remain one of the most important institutions entrusted by the community with the task of caring for and upbringing its children and providing them with knowledge, skills, values, trends, and patterns of behavior, along with its educational and social goals working to achieve to serve the environment and society. It is a fact that the objectives of environmental education are consistent with the objectives of the curricula in the basic education stage, such as protecting the environment and combating its pollution, preserving environmental laws Executive Orders (EOs), and balancing between its various components and all its natural systems (Simpson, 2006).

The great role and credit are due to educational institutions that seek to provide students with values that enable them to live in a clean and attractive environment and train them to deal with a clean environment within a value system by incorporating them in curricula and textbooks and focusing on their contents so that students can understand them. These values shall be realistic, accurate, closely related to the subject's objectives and topics, and achievable, and their learning outcomes shall be formulated in a form that can be observed, followed up, and evaluated. For this reason, the content analysis method is concerned with reviewing and examining the humanities by revealing the content of textbooks, enabling us to use this method to show the extent to which textbooks focus on environmental concepts (Doyal, 2004).

Recently, contemporary global trends have emerged trying hard to make the curriculum a means to overcome the challenges of the times, as it is the ideal educational tool for preparing human resources capable of being a comprehensive development tool. Science and social studies curricula in different countries of the world have received many reform efforts bringing them into line with modern developments and the requirements of each era. The textbook, the teacher, and the student are the main axis in the educational process as they work to provide the largest amount of knowledge and information necessary for students. However, modern theories adopt the opposite idea by focusing on the students themselves as the core of the educational process with the help of the teacher and employing the textbook as a tool, i.e. a link between the teacher and the student to access the necessary information, knowledge, and skills (Zeitone, 2010).

Scientifically speaking, science teachers and science educators believe that science textbooks are educational resources that represent the potential scenario for how to deliver content to students, lead terminology to teaching subjects, use their levels as a primary regulator of the level of proficiency expected of students, and support teachers in planning and teaching to meet global and local curricular standards (Chiappetta & Fillman, 2007).

## Literature Review

The extent to which environmental concepts are incorporated into curricula and textbooks has been addressed in a few studies at the entire level. Alzalabiya (2020) aims to reveal the degree of incorporation of health concepts in the Arabic language textbooks for the first three grades in Jordan. To achieve the objectives of the study, the analytical-descriptive approach is used, and the validity and reliability of the content analysis instrument are verified as well. The results of the study show that the concepts of psychological and social health are ranked first, while the concepts of environmental health are ranked second. Concerning the concepts of healthy nutrition, it is ranked third, and the concepts of physical health are ranked fourth. The concepts related to the field of diseases and their prevention have ranked fifth and last.

In the same vein, Mustafa, Rababah, and Aburrub (2019) aim to explore the extent to which environmental education concepts are included in the developed Islamic education textbooks for the first three grades in Jordan. The study concludes that the 3-grade Islamic education textbook is ranked first in terms of its content of environmental education concepts, while the 2nd-grade Islamic education textbook is ranked second. Regarding the Islamic education textbook for the first grade, it is ranked third and last.

Likewise, Saleh, Alrsa'I, and Alhelalat (2017) aim at investigating the degree to which health concepts are included in science textbooks for the first three grades in Jordan according to international standards. The results of the study show that the degree of inclusion of health concepts in the targeted textbooks in the study is of a low level. Another research work by (Mhidat, 2018) aims to identify the degree of inclusion of the concepts of environmental education in the geography textbooks for the upper basic from the point of view of social studies teachers. The results of the study show that the degree of inclusion of environmental education concepts in geography textbooks for the upper basic stage is of a low level.

Also, Almutairi (2016) aims to identify the degree of availability of environmental concepts in social studies textbooks for intermediate school classes in the State of Kuwait. The results of the study show that the degree of availability of environmental concepts in social studies textbooks at the intermediate stage in the State of Kuwait from the teachers' point of view is of a moderate level. The results also indicate that there are no statistically significant differences in the degree of availability of environmental concepts in the social studies textbooks in the intermediate stage in the State of Kuwait from the teachers' point of view according to the variable of gender, experience, specialization, and academic qualification.

Another work by Alfaqeer, Alsubhiyin, and Alrasai, (2014) investigates the educational health concepts included in geography textbooks of the higher basic stage in Jordan. The study reveals that the total frequency of health education concepts included in geography textbooks for the upper basic stage is (193), where the concepts of environmental health have ranked first, while the concepts of nutritional health have ranked last. The study also shows that there are differences between the total frequency of health education concepts and their percentages among the geography textbooks for the upper basic stage.

The study of Egan et al (2008) aims to review teachers' opinions about the culture of healthy food in secondary schools. The results show that teachers use a mixture of learning methods to teach a culture of healthy food education, stressing that the most important health concepts taught are good food cooking, hygiene, food storage, and the prevention of food contamination. Using the survey study by (Hubbard & Rainey, 2007), health education among secondary school students is evaluated by analyzing the textbook based on literacy education in acquiring health skills and concepts through the Health Education Assessment Project (HEAP), aiming to assess changes in perceptions and skills associated with risky behavior. The results of the study show the positive impact of the health education book in developing the concepts and skills necessary for health.

At the same time, Abu Hula and Al-Balawi (2006) aim to identify the extent to which health concepts are included in the science curricula at the intermediate stage and their suitability for 7th-grade students in the Kingdom of Saudi Arabia. Due to the nature of the study, a questionnaire is developed to measure these concepts. The results show the availability of

several health concepts in those textbooks, with a percentage of (30.96%) at the level of the three science textbooks in the intermediate school. The study conducted in Ohio State in the United States of America by (Oguz et al., 2004) aims to analyze the content of science textbooks for the sixth to twelfth grades to determine the degree to which the curricula deal with environmental education. To achieve the objectives of the study, (22) textbooks of biology, chemistry, physics, geology, environmental science, and science for intermediate school are analyzed. The results of the study show that addressing the environmental issues is of a low and insignificant level.

In light of the aforesaid review of the previous studies, there is a dire to identify the degree of availability of environmental concepts in science and social studies textbooks by tackling these environmental concepts that pertain to the environmental aspect so that they are positively reflected on students and learners to provide them with knowledge, concepts, trends and values, and training them to employ different skills and styles of thinking (Hurson, 2008).

Problem of the Study

Environmental concepts have recently attained great importance as a result of the development of human awareness of environmental problems and issues at all international, regional, and local levels. As a result of the development of this awareness, numerous studies have been conducted and several international conferences and symposia specialized in the field of environmental protection have been held. The recommendations of these studies and conferences have encouraged developing educational curricula, courses, and programs that seek to assist the students and learners in acquiring the environmental concepts, skills, and values necessary to create environmental awareness, enabling them to understand and appreciate the relationships between them and their natural environment and helps them to practice in making decisions related to their environmental problems (Danielraja, 2019; Ahammad & Parvin, 2019; Singh, 2013).

Importantly, the researchers' work in teaching science and social studies curricula and their teaching methods in Jordanian universities creates a necessity to investigate the degree of availability of environmental concepts in science and social studies textbooks from the teachers' point of view, especially since zero comparative studies have been conducted before to investigate the degree of availability of these concepts in the targeted textbooks, i.e. 7th-grade Science and Social Studies Textbooks. More specifically, the problem of the study lies in exploring the teachers' perspectives on the availability of environmental concepts in Jordanian science and social studies textbooks of seventh grade.

Objective of the Study

Due to the nature of the study, the objectives of the research are:

1. Exploring the teachers' perspectives on the availability of environmental concepts in the Jordanian 7th-grade science and social studies textbooks.

2. Identify whether there are statistically significant differences at the significance level ($\alpha \leq 0.05$) between the estimates of science teachers and social studies teachers for the degree of availability of environmental concepts in the Jordanian 7th-grade science and social studies textbooks.

Question of the Study

The following research questions are formulated to achieve the objective of the study.

1. What are the teachers' perspectives on the availability of environmental concepts in the Jordanian 7th-grade science and social studies textbooks?

2. Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) between the estimates of science teachers and social studies teachers for the degree of availability of environmental concepts in the Jordanian 7th-grade science and social studies textbooks?

Significance of the Study

The significance of this study lies in the novelty of the topic and the lack of studies and research that have dealt with the subject of the study as the topic of teachers' perspectives on the availability of environmental concepts in Jordanian science and social studies textbooks of seventh grade is of great interest to many higher education institutions, scholars, and

researchers at the Arab and Jordanian levels. The importance of this study stems from the fact that curriculum planners and authors of science and social studies textbooks for the basic stage can benefit from this study to increase interest in environmental concepts, which contributes to achieving the goals of environmental education, providing a list of environmental concepts that can be included in science and social studies textbooks for the primary stage, and opening a new venue for other pieces of research and studies to investigate the degree of availability of environmental concepts in textbooks for the different educational stages.

Terms of the Study

The following are the terms and definitions of the study.

Environmental concepts: They are abstract mental conceptions that are given a name or an expression to denote an environmental phenomenon formed by assembling the common characteristics of the individuals of this phenomenon (Al-Nouh, 2007, p. 48).

7th-grade Science and Social Studies Textbooks: These are the courses authored by the Jordanian Ministry of Education and approved as of the academic year (2018-2019).

Limitations of the Study

This study is limited to exploring the teachers' perspectives on the availability of environmental concepts in the Jordanian 7th-grade science and social studies textbooks. This study is also limited to the extended period during the first semester of the academic year 2021/2022. This study is also limited to a sample of science and social studies teachers for the seventh grade in the Jordanian capital, Amman. Since the instrument used in the study are prepared by researchers, the generalization of the results, therefore, depends on the validity and reliability of this instrument.

## Methodology of the Study

Research Approach

To achieve the nature and objectives of the study, the descriptive-analytical method has been used to collect and analyze the data of this research problem using the measurement instrument, i.e. the questionnaire applied to a representative sample of male and female teachers of science and social studies for the seventh grade in the Jordanian capital, Amman during the first semester of the academic year (2020/2021).

Study Population

The study population consists of (349) male and female science and social studies teachers for the seventh grade in the Jordanian capital, Amman during the first semester of the academic year (2020/2021) as follows: (203) male and female science teachers and (146) male and female social studies teachers.

Study Sample

A stratified random sample has been selected from the study population consisting of (228) male and female teachers as follows: (133) male and female science teachers, and (95) male and female social studies teachers.

Study Instrument

To achieve the objectives of the study, the theoretical literature and previous studies addressing the quality of educational service have been suitably reviewed. The measurement instrument used in this study has been constructed after reviewing the theoretical literature, relevant previous studies, and reviewing the measurement instruments used in them. The measurement tool, i.e. the questionnaire in its initial form consists of (25) items distributed over four areas: natural environmental resources (6) items, environment, and population (7) items, cultural and environmental elements (4) items, environmental problems (8) items (Appendix 1 and Appendix 2).

Study Instrument Validity

To verify the validity of the study instrument, it has been presented to a 10-validator committee with competence and experience from faculty members specialized in the field of curricula and teaching methods, along with supervisors of social studies and sciences. The modifications and suggestions of the members of the committee have been considered, as the language of some items is modified when seven validators have agreed on that.

Study Instrument Reliability

To verify the reliability of the study instrument, the reliability coefficients of the questionnaire are calculated through the application and re-application method, as it is applied to an exploratory sample of (26) male and female teachers from outside the study sample twice with a 2-week interval between the first application and the second application. Pearson's correlation coefficients are also calculated between the results of the two applications, where the reliability coefficients for the areas have ranged between 0.84 and 0.91, and the total value of the correlation coefficient for the questionnaire is (0.93), which are deemed acceptable values for conducting such a study (Lord, 1985).

Study Instrument Correction

A 5-step scale, similar to the 5-point Likert scale has been used to assess the degree of availability of environmental concepts in science and social studies textbooks for the seventh grade in Jordan from the point of view of teachers. The 5-step scale is as follows: very high, high, moderate, low, and very low, where the following numerical ratings (5, 4, 3, 2, and 1) are given, respectively. The following statistical grading is used to distribute the means (Odeh, 2014):

First: (1.00 - 2.49) refers to a low degree of availability.

Second: (2.50 - 3.49) refers to a moderate degree of availability.

Third: (3.50 - 5.00) refers to a high degree of availability.

Study Variables:

The study includes the following variables:

First: The moderating variable: It is the subject taught by the teacher and has two levels: science and social studies.

Second: The dependent variable:

The degree of availability of environmental concepts in the 7th-grade science and social studies textbooks in Jordan from the teachers' point of view expressed by the means of the estimates of the sample members on the items and areas of the questionnaire.

Statistical Processing

The following statistical processing, namely: means, standard deviations, and T-Test for independent variable are used and calculated to conduct the statistical processing.

## Results and Discussion

This section gives insight into the results and discussion related to the questions of the study.

First question

What are the teachers' perspectives on the availability of environmental concepts in the Jordanian 7th-grade science and social studies textbooks?

To answer this question, means and standard deviations of the estimates of science teachers and social studies teachers on the items of the questionnaire are calculated, as they are shown in Table (1).

Table 1 *Means, Standard Deviations, and the Degree of Availability of Environmental Concepts*

| No. | Areas | Estimates of Science Teachers | | | Estimates of Social Studies Teachers | | |
|---|---|---|---|---|---|---|---|
| | | Means | Standard Deviations | Degree of Availability | Means | Standard Deviations | Degree of Availability |
| 1 | Natural environmental resources | 3.76 | 61.0 | High | 3.64 | 0.44 | High |
| 2 | Environment and population | 3.70 | 50.0 | High | 2.68 | 0.47 | Moderate |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | Cultural and environmental elements | 2.67 | 0.55 | Moderate | 3.84 | 0.48 | High |
| 4 | Environmental problems | 3.51 | 54.0 | High | 3.70 | 0.43 | High |
| The Instrument as a Whole | | 3.49 | 0.42 | Moderate | 3.42 | 0.39 | Moderate |

Table (1) shows that the degree of availability of environmental concepts in science textbooks for the seventh grade from the point of view of science teachers is of a moderate degree, as the means of the estimates of the sample members on the areas of the study instrument as a whole is (3.49). Table (1) also shows that the area of “natural environmental resources” is ranked first with a mean of 3.76, followed by the area of “environment and population” in the second place with a mean of 3.70. As for the area of “environmental problems”, it is ranked third with a mean of (3.51), while the area of "cultural and environmental elements" is ranked last with a mean of (2.67).

More importantly, the reason for attaining a moderate degree of availability of environmental concepts in school science textbooks may be due to the focus of those textbooks on other scientific concepts such as physical and chemical concepts, requiring that these textbooks shall include more topics related to the environment. More specifically, it is found that this result is because the involvement of specialists in environmental education when planning science curricula and textbooks is still below the required level, knowing that the document of the general framework and the special and general outcomes of those curricula in the basic education stage emphasizes the significance of supporting the learners’ relationship with their natural environment and its various components, acquiring environmental awareness, and broadening their awareness towards the environment (Ministry of Education, 2013).

On the other hand, table (1) shows that the degree of availability of environmental concepts in social studies textbooks for the seventh grade from the point of view of social studies teachers is of a moderate degree, as the means of the estimates of the sample members on the areas of the study instrument as a whole is (3.42). Table (1) also shows that the area of "cultural and environmental elements" is ranked first with a mean of (3.84), while the area of "environmental problems" is ranked second with a mean of (3.70). Regarding the area of "natural environmental resources", it is ranked third with a mean of (3.64), and the area of "environment and population" is ranked last with a mean of (2.68). It is found that this result is because the nature of social studies curricula and textbooks is concerned with the relevant concepts in the cultural and social environment of the learner more than the relevant concepts in the natural environment, including living and non-living organisms.

Q2. Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) between the estimates of science teachers and social studies teachers for the degree of availability of environmental concepts in the Jordanian 7th-grade science and social studies textbooks?

To answer this question, means, standard deviations, and t-test for the differences between the estimates of science teachers and the estimates of social studies teachers are calculated for the degree of availability of environmental concepts in science textbooks and social studies for the seventh grade on the areas of the study instrument and the instrument as a whole, as shown in Table (2).

Table 2 *Means, Standard Deviations, and T-test for Independent Data to Indicate the Differences between the Estimates of the Study Sample for the Degree of Availability of Environmental Concepts in Science and Social Studies Textbooks for the Seventh Grade*

| Area | Estimates of the Study Sample | No. | Means | Standard Deviations | Degrees of Freedom | T-Value | Sig |
|---|---|---|---|---|---|---|---|
| **Natural environmental resources** | Science Teachers | 133 | 3.76 | 61.0 | 226 | 1.726 | 0.063 |
| | Social Studies Teachers | 95 | 3.64 | 0.44 | | | |
| **Environment and population** | Science Teachers | 133 | 3.70 | 50.0 | 226 | 15.730 | 0.001* |
| | Social Studies Teachers | 95 | 2.68 | 0.47 | | | |
| **Cultural and environmental elements** | Science Teachers | 133 | 2.67 | 54.0 | 226 | 18.187 | 0.001* |
| | Social Studies Teachers | 95 | 3.84 | 0.43 | | | |
| **Environmental problems** | Science Teachers | 133 | 3.51 | 0.55 | 226 | 2.772 | 0.023* |
| | Social Studies Teachers | 95 | 3.70 | 0.48 | | | |
| **The Instrument as a Whole** | Science Teachers | 133 | 3.49 | 0.42 | 226 | 1.294 | 0.125 |
| | Social Studies Teachers | 95 | 3.42 | 0.39 | | | |

* Statistically significant at the level of statistical significance (≤ 0.05 α)

Table (2) shows that there are no statistically significant differences between the means of the estimates of science and social studies teachers in the area of natural environmental resources and the instrument as a whole. However, there are statistically significant differences between the means of the estimates of science and social studies teachers in the area of environment and population in favor of the estimates of science teachers, and in the areas of cultural and environmental elements and environmental problems in favor of the estimates of social studies teachers.

More significantly, this result is attributed to the fact that the concepts of water, climate elements, soil, rocks, space, and minerals are presented in science and social studies textbooks according to the sequencing method in presenting these concepts. In detail, the sequencing method requires focusing on these concepts in the textbooks of the higher and lower grades directly, as they are appropriate for the age groups, and that the textbooks of the seventh grade have focused on other topics compatible with the general framework of textbooks and the adoption of international standards, which recommend topics that integrate with the stages of other grades.

Importantly, it is found that social studies textbooks focus on environmental problems related to communication between human cultures, as this refers to the rapprochement between human cultures towards agreement among all peoples of the world to address many global environmental problems such as political and economic issues to combat bullying and international violence, which is reflected in the spread of diseases and the increase in pockets of poverty and the increase in unemployment rates. Therefore, it is necessary to train young people to address such issues and to propose appropriate solutions. More importantly, it is noted the social studies textbooks center on the area of cultural and environmental elements, which include concepts related to human beings, the human relationship with natural resources, the concepts of animal organisms and their relationship to humans, and the concepts of microorganisms, where all of these concepts correspond to the age group of seventh-grade students and are also characterized by continuity in teaching these concepts.

## Conclusion

In a nutshell, the study aims to explore the teachers' perspectives on the availability of environmental concepts in the Jordanian 7th-grade science and social studies textbooks of seventh grade. The results show a moderate degree of availability of environmental concepts in science textbooks, as the concepts of natural environmental resources are ranked first, while the concepts of environment and population are ranked second. Concerning the concepts of environmental problems, they are categorized in the penultimate rank, while the concepts of cultural and environmental elements are ranked last place. The results also show a moderate degree of availability of environmental concepts in social studies textbooks, as the concepts of cultural and environmental elements are ranked first, while the concepts of environmental problems are ranked in second place. About the concepts of natural environmental resources, they are ranked in third place, and the concepts of environment and population are in the last place. Besides, the results indicate that there are no differences between the estimates of the study sample in the area of natural environmental resources and the instrument as a whole and there are differences between the estimates of the study sample in the area of environment and population in favor of science teachers. As a final point, there are differences between the estimates of the study sample in the areas of cultural and environmental elements and environmental problems in favor of social studies teachers.

## Recommendations

In light of the results, the current research recommends re-considering the integration of all environmental education concepts within the general learning system to include objectives, programs, activities, and implementation mechanisms, and take into account the abilities, inclinations, readiness, and level of maturity of students, focusing on activating the role of partnership and raising the level of coordination between the Ministry of Education, the Ministry of Environment, the Ministry of Higher Education and the bodies related to the environment, employing various strategies in developing environmental awareness and benefiting from talking about it, such as using television and radio programs and discussion forums, and holding training courses for science and social studies teachers to raise the level of their performance towards their students in employing environmental concepts.

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