CONTENT ANALYSIS: INCLUSION OF SCIENCE, TECHNOLOGY AND SOCIETAL ASPECTS IN THE VI GRADESCIENCE BOOK OF IRAQ

[1]Noor Mohammed Kadhim
Ph.D. Research Scholar, Madurai Kamaraj University
Dept. of Education
Madurai625 021, Tamil Nadu
E-mail: nooorphd@gmail.com
[2]Dr.R.Meenakshi,
Assistant Professor & Head i/c
Dept. of Education
Madurai Kamaraj University
Madurai - 625 021, Tamil Nadu
E-mail: drmeenaeducation18@gmail.com
[3]Dr.B.Kannan
Assistant Professor
Centre Educational Research
Madurai Kamaraj University
Madurai - 625 021, Tamil Nadu
E-mail: kannaneducation@yahoo.co.in

Abstract

This article focuses on analyzing the content of the science book for the sixth grade of primary school based of science, technology, and society, The researcher depended on the analytical descriptive approach, and the research sample consisted of a sixth-grade science book. To achieve the objectives of the research, the researcher designed a tool for analyzing the content of the 6th-grade science book according to STS, The procedures for this research were implemented in the first semester of the year 2021/2022. The results of the research showed that there is a weakness in the content of the 6th-grade book on primary school of science, technology, and society

KEYWORDS: Content Analysis, Sixth GradeScience Book, Abbreviation: Science, Technology And Society (STS)

NEED FOR THE STUDY

The time in which we live now is the age of science and technology, the effects of which are reflected on the aspects of human life, and the progress of states in all fields is based on their possession of the elements of science and technology. To overcome the problems he faces, and since the textbook is the main source of information in the different stages of education. Education is facing a great challenge that requires it to prepare those individuals who are able to face the challenges, problems and issues of this age. The researcher felt that it is necessary to include in the science curricula that contribute to solving problems and making decisions in the practical life of individuals. The interviews of science teachers confirmed this feeling, and that one of the most important of these. The concepts are science, technology and society (STS), As global concepts keep pace with the tremendous developments of scientific knowledge that is increasing day by day, as the studies that dealt with concepts of interaction between science, technology and society in the science book through the process of content analysis are very few and do not exceed one study (within the limits of the researcher's knowledge), which is the study of (Al-Bashir 1998) in Iraq, where she analyzed biology books in the secondary stage in Iraq through the biological community concepts and building a guide to teach them, so the idea of this research was,

especially at this time, as the Ministry of Education developed the course of the Principles of Science book for the sixth grade, and the sixth grade book was chosen. The developer in 2017 to be analyzed to reveal (STS) in it; As this course is new, it needs an analytical and evaluative study as it is in the experimental stage to identify its strengths and weaknesses through the analysis process in order to provide students with a scientific and technological culture that enables them to understand the interrelationship between science, technology and society and helps them make informed educational decisions in their daily lives. Based on this, the research problem was identified in the following question:

To What Extent The Science Book For The Sixth Grade Of The Primary School In Iraq Includes Concepts Of Science, Technology And Society (STS)?

RESEARCH IMPORTANCE

The textbook is a major part of the syllabus in its comprehensive sense rather, it is a tool of the curriculum and has an effective role in the educational process, the scheduled scientific book is a basic building block in the learning and teaching process, and a source of low-cost student education, coupled with technological alternatives, and it is easy to evaluate, develop and enrich with drawings and image, (Al-Tamimi, 2009: 244), and it is the container that contains the educational material, which is one of the most important means necessary to achieve the objectives of the educational curriculum and its effective role in the success of the educational process.

(Al-Hashemi, and Mohsen, 2010: 79)

There have been calls for the development of the content of science, as curricula are seen at present, especially in developed countries, as the first way to bring about the desired change for members of society to be able to make the appropriate decision that is in line with the requirements of the age in it. The possibilities of science, technology, and society and their uses in the lives of individuals are invested as a basis for their contents. These curricula must always be subject to experimentation, continuous evaluation, and modification in line with these accelerating changes, in the context of the emergence of the entrance (STS) as a modern trend in scientific education and its wide spread in the eighties and nineties in the twentieth century and to achieve this transformation in the various science curricula in the general and secondary education stages, science curricula planners and textbook authors were keen to include in their content some technological and social aspects (abdulsalam 2006: 337),one of the ways that help in linking knowledge to life is the inclusion in the curriculum of some concepts such as science, contemporary social concepts, and applications of science in life, according to what suits the topic of the unit. these concepts draw students' attention to the importance of knowledge in life and its impact on improving living conditions and overcoming the problems facing humanity.

(Ashour, 2004: 319)

OBJECTIVE OF THE STUDY

To What Extent The Science Book For The Sixth Grade Of The Primary School In Iraq Includes Concepts Of Science, Technology And Society (STS))for the academic year (2021-2022).

LIMITS OF RESEARCH

Defining the Concept of Science, Technology, And Society in the book of Science for the sixth grade of primary school in Iraq.

TERMS & DEFINITIONS

- **THE CONTENT ANALYSIS:**It is a set of procedures by which the material (content) is dismantled into its primary elements with clarification of the relationship between each of them.
- **ASPECTS OF SCIENCE, TECHNOLOGY AND SOCIETY (STS):**A set of local and global concepts It affects the environment and society negatively and positively as a result of the human use of scientific innovations, which were identified in the list of concepts of science, technology and society (STS), which amount to fifteen concepts, according to which the content of the biology course for the second intermediate grade will be analyzed in Iraq.
- **6TH GRADE SCIENCE BOOK:**It is the first edition that was completed by a group of experts in the Ministry of Education and under the supervision of a committee from UNESCO in 2017.

- **6TH GRADE OF PRIMARY:**It is the last stage of the primary school stage, which helps the student to think properly, and to provide him with the skills, knowledge and experiences that prepare him for life. At this stage, the student is 12 years old.

METHODOLOGY-IN-BRIEF

The researcher followed the descriptive analytical method in analyzing the content of the science book for the sixth grade of primary school, which seeks to determine the existing situation of a particular phenomenon, and then describe it based on studying the phenomenon as it is in reality and describing it accurately.

The descriptive approach is one of the forms of organized scientific analysis and interpretation to describe a specific phenomenon or problem, and depict it quantitatively by collecting data and codified information about the phenomenon or problem, classifying and analyzing it, and subjecting it to careful study (Melhem, 2002: 352), and this approach aims to understand the present in order to direct the future with the available data and facts that can lead to conclusions on which to base the planning process for the future.

(Al-Hashimi And Mohsen, 2009: 75)

THE RESEARCH SAMPLE

The research sample consisted of a science book for the sixth grade in Iraq for the academic year 2021-2022, which constitutes a statistical community, as shown in table (1)

TABLE 1: RESEARCH SAMPLE

No	Name of the book	Stage	Edition	Publication	Page No
1	Science book for the sixth grade in Iraq	6^{th} grade	First	2017	260

The researcher excluded the main titles, the introductions from each book, the questions at the end of each chapter, and the content pages. after interviewing a number of teachers, the researcher also excluded what you learned, and the number of pages reached (250) pages.

THE TOOLS

The researcher does not to the lack of a tool that accurately fits this research, the researcher followed the following steps:-

1. Reviewing educational literature and several previous studies that dealt with concepts of science, technology, and society.
2. Building a list of these areas for the science book for the sixth grade of primary school, which consisted of seven main areas: (hunger and food sources, water resources, human health and disease, land use (soil), air and atmosphere quality, mineral resources, communication technology) (Appendix 1).

Determine the purpose of the analysis

The tool aims to identify the fields of science, technology, and society with their sub-indicators in the science book for the sixth grade of primary school, and it includes each of the following areas:

- Air quality and atmosphere
- Human health and disease
- Hunger and food sources
- Communication Technology
- Mineral Resources
- Use of the land (soil)
- water sources

VALIDITY OF THE TOOL

Validity is one of the most important factors for the success of scientific research in general and content analysis in particular. the fields of science, technology, and society annex (1) on a group of arbitrators who are experts and specialists in science, teaching methods, education, and psychology to ensure the clarity of its formulation, the integrity of its language, and the appropriateness of its design for the study. in a table(2)

Table 2: Percentage of experts' agreement

No	Dimensions (STS)	Percentage of experts' agreement
1.	Air quality and atmosphere	80.76%
2.	Human health and disease	85.34%
3.	Hunger and food sources	75.66%
4.	Communication Technology	79.39%
5.	Mineral Resources	81.60%
6.	Use of the land (soil)	87.73%
7.	water sources	81.67%
Total		**572.09**
Average		**81.72**

RELIABLE

It means that the results shown by the tool are fixed in the sense that they refer to the same things or results if they were re-applied to the same sample in the same conditions after an appropriate period.

(atiya, 2010: 111)

the researcher used two types of stability to obtain acceptable stability, namely:

1. Agreement over time: the researcher re-analyzed after (30) days, using the "holsty" equation. the reliability coefficient appeared between the researcher and himself (91,74), which is a high value.

2. The agreement between the analysts: the researcher hired analysts with experience in analyzing the content, and this was done by choosing a random sample of the book's content (250) pages, as the sample was approximately (20%), meaning (62) pages, and the calculated stability coefficients were shown in table (3)

Table (3) stability of analysis for analysts

Agreement over time	The researcher is with himself after 30 days have passed	93,71
agreement among analysts	Researcher and the first Analyst	83,25
	Researcher and the second Analyst	84,82
	The first and second analyzer	78,65
Average	85,10	

The average reliablewas (85.10), and thus the stability coefficient is good.

Analysis procedures

1. Analysis Unit

The researcher divided the content into certain categories or units to be able to study each unit by calculating its frequencies. The unit of analysis depends on the nature of the analyzed material and the nature of the problem under research. The researcher relied on two units in analyzing the content as follows:

A. Recording Unit

The unit of the record is the smallest part of the analyzed content through which to count what is to be diagnosed in that content. Berelson and Budd mention that there are five

basic units of analysis: the word or symbol, the idea or phrase that carries the idea, the unit of the subject, the personality, and the measures of distance and time. The researcher chose the idea unit, which is one of the most important and largest units of content analysis and is divided into two types: the explicit idea and the implicit idea, as the researcher adopted the two ideas together because they fit the nature of the research.

B. Context Unit

In this unit, the researcher used the counting and measuring tools for the recording units based on explicit and implicit ideas after carefully reading them to determine the content of the scientific expression and encoding it in the correct dimension.

2.Enumeration Unit

The researcher used the method of calculating repetitions as a unit to enumerate the emergence of ideas in each paragraph of the classification and its fields, and he gave each of the categories equal weight. Accordingly, the repetition of one of the paragraphs is the sum of the times the thought of this paragraph appears during the analysis, and the sum of the repetitions of the paragraphs in any field expresses the repetition of the same field.

TEXTBOOK CONTENT ANALYSIS RULES

To analyze the content of the science book, the researcher relied on the following steps

1. A list of the main and subsidiary dimensions of scientific culture with their indicators has been prepared in (Appendix 1)
2. The entire topic was read to get to know the idea it contains in general.
3. The topic was carefully read again to determine the idea it contains so that the researcher can determine the field to which the idea contained in the paragraph or topic belongs, and thus apply the unit of context, and determine the dimension, category, or paragraph to which each idea belongs, and this represents a unit, Register.
4. The class of value was determined in each idea according to the prepared classification, and the implicit idea was isolated from the explicit.
5. When each main idea contains a sub-idea, each idea is treated as an independent unit in the analysis.
6. If two or more ideas appear in the sentence, one of them is a cause and the other a result, the researcher treats each of them as an independent idea.
7. If the idea does not give a clear value connotation because it is related to each other or afterward, the previous and subsequent readings were referred to diagnose the idea.
8. In the event of values that cannot be placed in a classification, the researcher relied on the opinion of a committee of specialists to include them in the classification as separate values
9. Emptying the results of the analysis into the analysis form, by giving one repetition for each idea, that is, one of the paragraphs of the tool, and this represents the census unit.
10. The researcher excluded the cover, introductions, graphs, indexes, what you learned, and assessment questions at the end of the chapter.

- These rules were applied by the researcher in analyzing the content of the science book.

STATISTICAL TREATMENTS:

1.**Holstey's equation**: to find the stability of the book analysis between the researcher and himself and other analysts.

2.**percentage**:

$perce$

(Abd al-Rahman and Adnan, 2007: 237)

SHOW THE RESULTS

The researcher used the content analysis tool Appendix (1) in analyzing the content of the science book for the sixth grade of primary school to identify the extent to which concepts of science, technology, and society are included in this content. The results of the analysis have been clarified for each of the concepts mentioned in Table (4).

Table 4: Results for the analysis of Concepts(STS)

No	STS	repetitions	%
1.	Air quality and atmosphere	153	18.91%
2.	Human health and disease	207	25.58%
3.	Hunger and food sources	98	12.11%
4.	Communication Technology	33	4.07%
5.	Mineral Resources	76	13.59%
6.	Use of the land (soil)	110	9.39%
7.	water sources	132	16.13%
	Total	809	100%

Through the results mentioned in Table (4), it is clear that the content of the Science Book included the above-mentioned concepts, but in varying proportions.

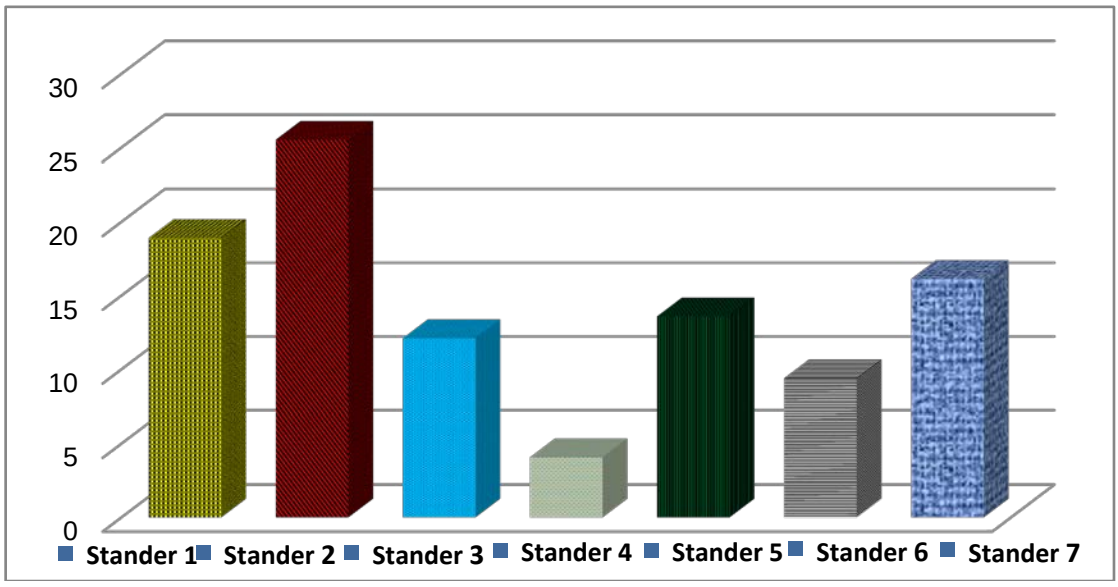
From the foregoing, the researcher believes that the science book for the sixth grade does not include STS in the appropriate quantity and quality that achieve the objectives of the STS approach, although the prescribed scientific material provided many opportunities that could have been exploited and presented to discuss some concepts related to science, technology, and society, which makes the student able to assimilate them, and the researcher believes that the reason for this is that the authors of this course did not take into account the concepts raised in the analysis tool. Although these concepts were of great importance to the student, they could have been included in the content.

The researcher believes that the science book for the sixth grade did not contribute to the preparation of the scientifically and technologically educated person, as follows:

1. Some cases have obtained high frequency and percentages compared to other concepts. These concepts are air and atmosphere quality, human health and disease, water resources, and land use (soil).

2. Some cases received weak percentages, such as Communication technology, hunger and food sources, mineral sources.

Figure1: Presenting the results of science, technology and society



We conclude from the above results that the content of the Sixth Grade Science Principles book focused more on the areas of air quality and atmosphere, human health and disease, water resources, land use (soil) more, and gave less attention to concepts (communication technology, hunger and food sources, mineral resources).

CONCLUSIONS

Through the research results, the researcher reached the following conclusions

1. The book Principles of Science for the sixth grade of primary school focused primarily on air quality and atmosphere, human health and disease, water resources, and land use (soil) from other fields.
2. The imbalance in the areas of science, technology, and social concepts among them.

RECOMMENDATIONS

Through the results of the research, the researcher recommends the following:

1. Developing the science book for the sixth grade in the light of (STS) entrance.
2. Reconsidering the inclusion of the content of the science book for the sixth grade of primary school, by including in its content concepts resulting from the interaction of science, technology, and society, to emphasize the adoption of modern trends in building curricula, due to the importance of students' awareness of this interaction for their lives on the one hand and their society, on the other hand, Emphasis also on social concepts related to science and technology.

SUGGESTIONS

To complement this study, the researcher suggests the following:

- Conducting a similar study to analyze books of other scientific subjects and for different academic levels.

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Appendix:

Appendix1: Dimensions ofScience, technology and society (STS)

No	**Standards STS**	Aspects
1.	Air quality and atmosphere	- acid rain - CO2 concentration increase - Global Warming - deterioration of the ozone layer - the noise - Multiple air pollutants
2.	Human health and disease	- Malnutrition and overeating - Low health awareness - The spread of epidemics and infectious diseases - The effect of smoking on the health of the individual and society - Lack of health services - Disease outbreaks - Fitness and health - Prevention of communicable and non-communicable diseases - Disease outbreaks - Psychological health - High costs of treatment - Awareness of medication use - first aid
3.	Hunger and food sources	- Poor food production - poor food distribution - neglect of agriculture - Diseases affecting plants and animals - Food Contamination - How to preserve agricultural crops - Modern irrigation methods - food preservatives - Food preservation methods - food manufacturing
4.	Communication Technology	- Wireless connection - Satellites - World wide web
5.	Mineral Resources	- Recycling of products and waste - modern mining technology - Searching for minerals at the bottom of the sea
6.	Use of the land (soil)	- soil erosion - desertification - Drought - reclamation

		- The decline of agricultural land - agricultural land dumping - over consciousness - loss of wildlife habitat - city growth - Soil contamination with pesticides and toxins
7.	water sources	- lack of water resources - depletion of water resources - surface water pollution - ground water pollution - River pollution with fertilizers and pesticides - pollution of waterways - Instructions for using water