

The analysis of the content of biology books for the fourth grade of science branch in the light of the dimensions of the blue economy

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Chapter One: An introduction to Research

The research problem:

The high rate of poverty and unemployment, the increase in environmental pollution in many countries of the world, especially developing countries, and the slow global economic growth have prompted researchers to conduct research and studies on how to overcome the obstacles facing the world and invest all efforts and human and material energies to find solutions to the problems of our time and to harness the possibilities offered by the oceans, seas and daylights at the national level to contribute to diversifying investment opportunities and providing job opportunities related to the economic dimension, as well as finding real and realistic solutions to the bad practices that the seas and oceans are exposed to, especially pollution and overfishing related to the environmental dimension and the need to move towards the blue economy and pay attention to it because of its economic importance that depends on the seas And the oceans and their coasts, including fishing, maritime transport, ports, marine mining, marine energy, extractive activities on the seabed, bioprospecting and others.

Based on this , the idea of the study was extracted, and this is what prompted the researcher to analyze the content of biology books for the fourth scientific class, as the researcher is

A biology teacher in a government school and has direct contact with the curricula, teachers, students and parents. In light of this, we can define the problem of the current research in the following question:

- (To what extent is the content of biology books for the fourth grade included in science according to the dimensions of the blue economy?)

The importance of research:

The interest in the blue economy stems from the importance of the seas and oceans, which represent a means of transportation for more than 80% of global trade. The seas and oceans cover 72% of the surface of our planet and constitute more than 95% of the atmosphere, while the deep sea floor provides 32 of the global supply of hydrocarbons. There is an expansion Therefore, the importance of the blue economy is reflected in the following:

- The oceans and seas and the wealth they produce play a pivotal role in fighting poverty and ensuring food security. (BKDE,2018,,140-141)
- Paying attention to the blue economy means finding solutions to pollution of the seas and oceans (sewage, agricultural and health), overfishing and finding new sources of energy.

- Marine organisms absorb and sequester 2.4% to 4.6 of carbon emissions in the world, where the sequestered carbon is called blue carbon.
- More than one billion people depend on fish products to meet their animal protein needs.
- The interest in the paper economy leads to an increase in the area of agricultural land and green areas, especially in coastal wet areas.
- The blue economy at the global level is considered a real engine for economic and social development, as the oceans and seas are one of the main factors that determine the strength of countries and their level of development.
- Achieving sustainable development goals related to the conservation and sustainable use of seas, oceans and marine resources, and the preservation of water resources and the resources and wealth associated with them. (Economic Council,12,2018)

On this basis, the researcher believes that those in charge of the curricula must keep pace with the scientific developments and the issues of the times and provide a clear idea about the term blue economy and the dimensions it includes, especially in the biology curricula (especially in the biology book for the fourth scientific grade) and give a clear idea to the students about this concept, its characteristics and importance Because it will provide them with a picture of the environmental and economic importance of the seas and oceans and the need to preserve them from the dangers threatening them, most notably pollution, rising temperatures and others.

The research goal:

The research aims to analyze the content of biology books for the fourth scientific grade according to the dimensions of the blue economy.

search limits:

The current research was limited to the Eleventh Edition of Biology for the fourth scientific grade (2019AD) ninth edition.

Defining the terms:

The blue economy is defined by the Economic, Social and Environmental Council as “an economy that improves human well-being and promotes social justice, while greatly reducing environmental risks and scarcity of resources” (Economic Council, 15, 2018).

As defined by (Gibran and Iman, 2018), it is “an economy that achieves a balance between economic, commercial, regulatory and legislative activities, and it is also an economy that supports the environment and provides the communities that depend on it with livelihoods and food.” (Gibran Wyman, 152, 2018)

And he defined it (Zuhaira and Bin Humaid, 2019) “It refers to the sustainable use of the seas, oceans and other water resources to achieve economic growth, improve livelihoods and create new job opportunities as well as activities that are undertaken to provide economic benefits and social services for current and future generations and to protect biodiversity in addition to that. It relies on clean technologies, renewable energy, waste reduction and recycling.” (Zuhaira and Bin Humaid, 30, 2019)

The researcher defines the dimensions of the blue economy theoretically: it is the set of dimensions that enable the student to acquire concepts and information, benefit from them, and deal correctly with the tremendous scientific progress that has taken place. These dimensions are the environmental, economic, social and technological dimension.

Procedurally, it is: It is the set of basic dimensions and its sub-paragraphs that are supposed to be included in the content of biology books for the fourth grade scientific, which was prepared by the researcher, and these dimensions are (environmental, economic, technological and social), which can be measured through the scale prepared by the researcher.

Chapter two: a theoretical framework

An introduction to the blue economy:

The concept of the blue economy has prevailed at the global level in recent years, and the name of the blue economy is attributed to the Belgian economist Gunter Pauli in the wake of the Rio +20 Conference on Sustainable Development and the Green Economy in 2012 in Rio de Janeiro, Brazil. It stresses the need to maintain and protect the sustainable management of water resources, based on The hypothesis that the healthy ecosystems of the seas and oceans are more productive, and they are obligatory for the sustainability of the existing ocean economies, and these resources must be used to increase efficiency in order to establish a group of interconnected projects that benefit the companies that create them and society, and the blue economy is considered one of the most important internal and external trade destinations It is also considered a gateway for the transportation of goods and commodities, as it provides countries with economic ways away from the depleted energy that threatens the environment and drains the rights of future generations. (Poor and Raymah, 61, 2019)

The Blue Economy Characteristics:

- The blue economy is part of the green economy according to the United Nations Environment Programs and international organizations.
- It is a sustainable marine economy through the development of the marine economy and the protection of the marine ecosystem in a good way and achieving sustainable use.
- The blue economy is a means to boost the economy. It provides economic opportunities that arise from activities related to resources, water resources and coastal resources for development and economic growth.

It is an economy based on seas and oceans and provides economic and social benefits for present and future generations by eliminating poverty and contributing to food and water security, increasing income and providing employment (Lu Wenhua and other,2019,3)

The blue economy goals:

- Protecting the marine environment and ensuring its sustainability, as the marine environment is exposed to a lot of destruction and damage from economic activities such as ocean acidification and marine pollution. The blue economy seeks to restore and protect ecosystems due to the multiple services it provides. (Elephant 331, 2010)

- Achieving food security and livelihoods and fighting hunger and poverty through the exploitation of all living resources in a sustainable manner.
- The blue economy aims to achieve social and economic well-being through new economic activities through the exploitation of sea and ocean resources such as aquaculture, mining and marine biotechnology.
- Using clean and renewable energy such as wind, waves, and tides to reduce the use of fossil energy.
- Mitigating climate change through seagrass and mangroves, which absorb about 25% of the carbon dioxide present in the atmosphere.
- The blue economy aims to build capacity, develop innovative solutions, develop human capabilities, employment strategies and educational tools, as well as new tools for representation and policies.
- It also aims at rational and rational management of marine resources by providing support and incentives to leaders in the public and private sectors and supporting efforts to preserve the safety of the seas and oceans, the welfare of societies and the continuity of the productivity of marine ecosystems for future generations. (Zuhaira and Bin Humaid, 38-37, 2019)
- Increasing scientific knowledge, developing scientific research capabilities and transferring marine technology, taking into account the governmental conditions related to the transfer of such technology in order to improve the health of the oceans and enhance the contribution of marine biodiversity.
- Effectively regulating fishing, ending overfishing, illegal fishing, unregulated fishing and some destructive fishing practices, and implementing scientific management plans in order to restore fish stocks to what they were. (Poor and Raymah, 65, 2019)

The blue economy is a path for sustainable development:

The sustainable management of the oceans is of the utmost importance to achieving sustainable development. How to work to achieve a balance between continuous economic development, environmental sustainability and social inclusion, poses great intellectual and practical challenges to the international community and development practitioners. The international community has proposed the blue economy approach to address the balance between the four dimensions of sustainable development (environmental, economic, technological and social).

The world's seas, oceans, currents, temperature, and their chemistry, and life in them are behind the global systems that make our planet suitable for human habitation. Throughout history, seas and oceans have been vital channels for transport and trade, and the careful management of this essential and global resource is an essential feature of a sustainable future. The blue economy is necessary to achieve sustainable development goals, especially with regard to eradicating hunger and poverty, achieving water and food security, reducing climate change and protecting the ecosystem, and among the goals adopted by the United Nations within the plan Sustainable development for the year 2030, there is an independent and important goal that seeks sustainable use and preservation of marine life, which is the fourteenth goal and states (conserving the seas, oceans and marine resources and their sustainable use to achieve sustainable development), and this goal of the sustainable development goals calls for (Conservation and sustainable use of the seas, oceans and marine resources for sustainable development.

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The dimensions of the blue economy:

There are four dimensions to the blue economy:

1- The environmental dimension: the reality that we must realize is that we live in a planet whose natural resources and wealth are excessively depleted, large and polluted, to a high degree that affects human life and health and also affects agricultural and industrial production now and in the future. Most of the effects on the ecosystem are activities Human beings, protecting the environment is a major part of development. Without the necessary and adequate protection for the environment, it negatively affects development. Without development, resources fall short of meeting the needs of investments, and the process of protecting the environment collapses. (Naji,30,2000)

2- The economic dimension: the blue economy focuses on the need to bring about fundamental changes in global economic procedures, making them more equitable

And justice, especially with regard to technology transfer, and international investments, in addition to addressing the economic and environmental aspects at the same time in ways that allow the global economy to achieve growth in developing countries in conjunction with giving greater weight to environmental problems although the quality of education contributes to the complications of the economy of countries, and for the purpose of ensuring the achievement of a sustainable blue society, it is necessary to provide in addition to the quality of education good governance with the commitment of the political leadership to the optimal and better use of environmental resources and addressing the problem of poverty, hunger, unemployment and others (Mujahid, 2019: 580)

3- The technological dimension:

The blue economy seeks to use clean technology that does not cause any harm to the environment and human health, and helps to use and adopt sustainable patterns of production and consumption. Modern technology has an important and effective role within the biosphere of the globe, and its role was prominent in many global issues, the most important of which are the following: Global warming, ozone hole, radiation leaks, and others. (Mutawa, 2007: 255)

4- The social dimension:

This dimension is one of the important advantages of the blue economy, because it shows the human aspect, which makes economic growth conducive to political and social cohesion. Economic growth in the absence of important social values is often accompanied by a catastrophic failure to achieve its goals. Therefore, the blue economy is achieved if specific and clear social values exist. (Naji, 2000: 25)

The researcher sees the importance of including in biology curricula everything related to the blue economy, namely:

Defining the term blue economy clearly in the curricula.

Explain the importance of the blue economy to the planet.

Explain the relationship of the blue economy to climate and climate change.

- Curricula should pay attention to environmental issues, preserve the cleanliness of seas and oceans, and protect the environment.

Highlighting the importance of clean, renewable energy and the use of modern and clean technology.

Show the dangers of environmental pollution and the black fossil economy.

The third chapter is research methodology and procedures

In his research, the researcher used the descriptive analytical method to analyze the content of biology books for the fourth scientific grade, and he used the method of content analysis, which is one of the survey methods in the descriptive approach, and because of its importance in revealing the extent of interest in the content, and it is considered the most important areas in which the method is used Content analysis is the field of textbooks and curricula. (Ahmed and Al Hammadi, 1987: 364), and content analysis (1990, Weber) defines the content analysis method as: a research method that uses a set of procedures to make honest inferences from the text. (Weber,1990,9)

Selecting data sources: This research included the content of biology books for the fourth grade of science recently written in the Republic of Iraq for the academic year 2019-2020 Table (1), as defining the research community is one of the main methodological steps in educational research, and it requires great accuracy on which the research procedure, its design, and the accuracy of its results depend. (Shafiq, 2001: 184)

The Biology textbook for the fourth grade science (1) table

No.	Title of the book	Edition	Number of pages analyzed
1	Biology book for the fourth grade of science	Edition 9 of 2019	150

Table No. (1) shows that the number of pages analyzed is (150) pages after the researcher excluded the main title, introductions, chapter titles, performance indicators, all chapter questions, and indexes.

The Research tool:

One of the requirements of the current research is to have a classification tool, according to which the content of the biology book for the fourth scientific grade is analyzed, related to the method of content analysis that the researcher used, as among its requirements is the existence of a classification that achieves the objectives of the current research and fits the analyzed material. (Holsti, 1969,95)

The researcher has prepared a list of the dimensions of the blue economy that must be available in the content of biology books for the fourth scientific grade, and its preparation has gone through the following stages:

- Reviewing some studies related to the dimensions of the blue economy.
- Access to books and literature that dealt with the topics of the blue economy.

In light of the foregoing, a list of the dimensions of the blue economy was reached for the content of the biology book examined in its initial form, which consists of (4) main dimensions that included (23) paragraphs.

Table (2) Dimensions and paragraphs of the blue economy :

No.	Dimensions	No. of items
1	environmental dimension	5
2	economic dimension	5
3	technological dimension	5
4	social dimension	6
Total		21

Analysis steps: The explicit idea was adopted as a tool for analysis, because it is the most widely used units of analysis, and it has sufficient capacity for the purpose of giving meaning, and it is small, which reduces the possibility of it being included in many directions compared to other units and because it is compatible with the nature of the analyzed content (Al-Jadri and Abu Helu, 2009: 217).)

Validity of the analysis: To ensure the validity of the analysis carried out by the researcher, a sample of the material analyzed for the content of the biology book for the fourth grade of science was presented to an expert in the methods of teaching life sciences, and he agreed on the validity of the analysis, which is what the researcher considered the validity of the analysis that he made ¹.

Analysis stability: Stability was calculated in two ways as follows: 1- Agreement over time 2- Agreement between analysts.

To calculate the two types, a specific sample of the analyzed material was selected representing approximately (20%) of the total content of the biology book of (150) that is (30) pages of the biology book for the fourth scientific class, which included (the ninth chapter the relationships between living organisms, behavior, environmental succession and separation tenth environmental pollution) was analyzed twice from

The researcher himself, with a time difference of (21) days, and again by another researcher and applying the hallucinatory equation, the following equation of stability was reached:

1- The agreement over time (0.80) 2- The agreement between the analyst and another analyst (0.85)². Thus, the stability coefficient is considered good, as some literature indicates that the stability rate of more than (70%) is considered good (Stmbly&Kenneth, 1972,105)

The researcher adopted the percentage (70%), then a hypothetical percentage to compare the results of the analysis, based on the agreement of the arbitrators and experts on this percentage, as the researcher presented a questionnaire to know the percentage in Appendix (3), and the agreement of experts and arbitrators was (100%).

Table (3)
Frequencies and percentages of the dimensions of the blue economy
in the biology book for the fourth scientific grade

No.	Dimensions of scientific culture	repetitions	percentage%	Verified paragraphs	%	(*) percentage %
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¹ . Prof. Haider Mesir Hamdallah / University of Baghdad - College of Education for Pure Sciences (Ibn Al-Haytham).

² Dr. Haider Adnan Muhammad - Diwaniyah Education Directorate

				%		
1	environmental dimension	38	50%	5	38.46%	61.90%
2	economic dimension	3	4%	1	7.70%	
3	technological dimension	12	15.8%	2	15.38%	
4	social dimension	23	30.2%	5	38.46%	
Total		76	100%	13	100%	

It means the percentage of the total number of paragraphs achieved*

It is clear from the results in Table No. (3) that in the book (76) recurrences distributed over four dimensions, the environmental dimension obtained the highest percentage, which is (50%), while the social dimension obtained (30.2%), and the technological dimension obtained (15.2%) and the economic dimension is at least (4%). It is clear from the table that the environmental dimension obtained the highest percentage because the book dealt with several different environmental issues and also dealt with environmental pollution of its various types and the negative consequences it causes on human life, living organisms and the environment, while the economic dimension obtained the lowest percentage, as the book did not deal with the economic aspects of the existing water resources In seas, oceans, investments, transport and others.

First: The Environmental Dimension Table No. (4)

No.	Items	Repetition	Percentage	Verified paragraphs	Percentage
1	marine pollution	3	7.89%	Total items	100%
2	Overfishing and decreasing marine life	5	13.15%		
3	Climate fluctuations and changes	1	2.63%		
4	Biodiversity of seas and oceans	26	68.44%		
5	Sustainably protect the seas and oceans	3	7.89%		
Total		38	100%		

It is evident from Table No. (4) that the paragraph (biological diversity of the seas and oceans) got the highest percentage, which is (68.44%), where the number of iterations reached (26) iterations, while the paragraph (fluctuations and climate changes) got one iteration at a rate of (2.63%).

Second: The Economic Dimension Table No. (5)

No.	Items	Repetition	Percentage	Verified paragraphs	Percentage
1	Mineral exploration and development of the	-	-	1	4.76%

	fisheries sector				
2	Supporting food and water security	3	100%		
3	Maritime transport, trade exchange, investment creation and job opportunities	-	-		
4	Rationalization and non-excessive use of water	-	-		
5	Providing job opportunities	-	-		
6	Mineral exploration and development of the fisheries sector	-	-		
Total		3	3		

It is clear from Table No. (5) that the paragraph (supporting food and water security) was achieved with only three recurrences at a rate of (100%), while the remaining five paragraphs were neglected and no repetition was achieved.

Third: The technological dimension Table No. (7)

No.	Items	Repetition	Percentage	Verified paragraphs	Percentage
1	Using clean, renewable energy and avoiding the use of technologies harmful to the environment	1	8.33%	2	9.52%
2	Sea and ocean water desalination	-	-		
3	Waste and waste water recycling	-	-		
4	Maritime monitoring and control of ships	-	-		
5	Global warming and the ozone hole	11	91.67%		
Total		11	100%		

It is clear from Table No. (7) that the paragraph (global warming and the ozone hole) got (11) recurrences at a rate of (91.67%), while the paragraph (using clean renewable energy and avoiding the use of

technologies harmful to the environment) got a rate of (8.33%) with one recurrence, while it was neglected. other paragraphs.

Fourth: The Social Dimension Table No. (8)

No.	Items	Repetition	Percentage	Verified paragraphs	Percentage
1	Reasonable and successful management of water resources by the state	3	13.07%	5	23.80%
2	Sharing water, marine resources and maritime borders between countries	-	-		
3	Risks of poverty, hunger, unemployment, water scarcity and desertification	4	17.39%		
4	Supporting scientific research in the field of marine and ocean sciences	1	4.34%		
5	Overpopulation, immigration and squatter housing	1	4.34%		
6	The importance of water in the existence and continuity of life	14	60.86%		
Total		23	100%		

It is clear from Table No. (8) that the paragraph (the importance of water in the existence and continuity of life) got a percentage of (60.86%) with (14) recurrences, while (the paragraph of supporting scientific research in the field of marine and ocean sciences) got the lowest percentage, which is (4.34%). With one repetition, a paragraph (the sharing of water, marine resources and maritime borders between countries) was neglected.

Conclusions, recommendations and suggestions:

Conclusions: From the results of his research, the researcher concluded the following:

- 1- The biology book for the fourth grade of science was at a good level compared to the spoken ratio adopted by the researcher based on the opinions of experts, which is 70%.
- 2- The environmental dimension got the largest number of iterations, achieving the first place, as well as achieving the largest number of sub-paragraphs achieved with (38) iterations, while the economic dimension got the least number of iterations with three iterations.

The Recommendations:

In light of the researcher's findings, he recommends the following:

- 1- The biology book for the fourth scientific grade should include all fields and dimensions of the blue economy that are related to the book's objectives and in balanced proportions.
- 2- There are some sub-paragraphs that have been neglected and that should be given some attention, such as the paragraph (recycling of waste and sewage, mineral exploration and development of the fisheries sector), especially that the content of the book includes water pollution, as well as eating fish and its morphological description and internal anatomy in detail. There are some Paragraphs that got a few repetitions despite their importance and the need to emphasize them, such as the clause (using clean renewable energy and avoiding the use of technologies harmful to the environment).

Suggestions: To complement the research procedures, the researcher suggests the following:

- 1- An analysis of the content of the biology book for the fifth and sixth scientific grades in light of the dimensions of the blue economy and the extent to which students understand it.
- 2- Analysis of the content of books of biology and other sciences for the intermediate stage in the light of the dimensions of the blue economy.

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