

## **Analysis of the content of the chemistry book for the third intermediate grade according to the skills of systemic intelligence**

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### **Summary**

The current research aims to identify the extent to which the third intermediate grade book includes the skills of systemic intelligence, and the research sample was represented by topics from the chemistry book for the third intermediate grade. Self-reflection, bearing the viewpoint, long-term systems orientation, systems management with oneself, systems management with people, systems management in general contexts). The analysis tool (analysis criterion) was built consisting of (32) indicators and the descriptive analytical approach was used to achieve the objectives of the research, and the validity and stability of the analysis tool were confirmed and using Cooper's equation, the following results were reached that the skills of systemic intelligence are included in the chemistry book for the third intermediate grade, but came in different proportions.

**Keywords:** content analysis, systemic intelligence skills.

### **Research problem:**

Rapid scientific and cognitive developments have appeared in various countries of the world, especially in the field of education, and this depends on finding curricula capable of keeping pace with the continuous and tremendous developments and working to develop and develop the levels of thinking and intelligence skills among students, to contribute to building a generation armed with knowledge and has the ability to think, analyze and possess skills. The issue of intelligence was and still is one of the most controversial topics, and systemic intelligence is one of the modern intelligences that has been discovered recently and has become one of the intelligences that concern the individual's ability to perceive the components of the system and know the relationship between them and influence it strongly and control the components of the system in ways that produce behavior and its development. The third intermediate grade is one of the important age stages for students, as it prepares the student for middle school life, and because society today has begun to undergo continuous and permanent processes of change that include its methods, needs and problems. And activities and construction on the basis of a plurality of experiences and activities so that each student gets them in line with his abilities Therefore, it is necessary to conduct a continuous analysis of the content of the textbook in terms of its vocabulary and methodology, so it was subjected to continuous review, scrutiny and evaluation to keep pace with these changes and meet these needs, and for the purpose of achieving those ambitions and aspirations, and through the researcher's humble experience (17 years), and her knowledge of the book of chemistry For the third intermediate grade, she noticed the lack of chemistry books for this type of skills and the need to include them in the content of the study material. It is considered an indication for conducting more research and studies on the inclusion of systemic intelligence skills in them, which prompted her to conduct an analytical study of the chemistry book for the third intermediate grade, to reveal the importance of systemic intelligence and the benefits of including its skills and how make use of it.

Hence, the problem of the current research can be determined by the following question:

**Q/ To what extent does the chemistry book for the third intermediate grade include systemic intelligence skills?**

### **research importance**

Education in general and scientific education in particular is facing significant and influential challenges in this era as a result of comprehensive and radical developments in all aspects of an individual's cultural, economic and social life. The reason for this is due to the tremendous development in the use of technology and in all aspects of life, which is almost the main reason for what we see of enormous changes (Nashwan, 2001: 5)

Education, with its different directions, is the means to achieve the goals of education and the requirements of society, from human energies, as it is the field that reflects the different goals of education, through educational institutions that are interested in preparing the innovative human mental personality. (An-Najm, 2005: 4)

Quality education is the beginning of countries to enter the gate of knowledge, as it tends towards providing the learner with a set of knowledge, facts, skills, trends and values, and developing their mental abilities, administrative skills and emotional values. (Al-Hashemi and Atiyah, 2009: 29)

All of this is one of the school's duties and responsibilities in preparing and educating its students in a manner that prepares for innovation capabilities to unfold and for the energies of scientific intelligence to grow and flourish, and to interact positively with the requirements of scientific and technological developments. (Nabil, 2001: 24)

Many scientists have been interested in the subject of intelligence, as it is considered one of the scientific topics that psychologists have been interested in because of its vital link in the field of one of the important methods of intelligence, which is systemic intelligence, which differs from the traditional methods of intelligence that depend in essence into separate molecules, while the approach to thinking and systemic intelligence focuses on How the parts interact with each other to produce the behavior that is the goal of the system Systemic intelligence is one of the most important products of scientific development in the field of psychology and mental abilities in the new millennium. (The Elephant, 2015: 47)

One of the sciences that has a direct relationship with human life, conditions and the development of his various abilities is chemistry, which has taken an important role in the development of societies economically, industrially and technologically. Improving his living conditions, and also contributed to the preparation of many chemical compounds that are used in various fields such as medicine, industry, agriculture and trade, which represent the main axis in improving the lives of individuals and societies alike. (Al-Sherbiny, 2006: 193) Therefore, it was necessary to analyze the chemistry books for the intermediate stage to find out the extent to which they include the skills of systemic intelligence. As the analysis of the content of the textbook is a scientific methodological process that has importance in various fields, including (the curriculum, the teacher, the textbook, the learner) and this appears by revealing the strengths and weaknesses, and accordingly the importance of the current research is as follows:

- 1) Supervisors, curriculum developers, and the Ministry of Education have benefited from the current research in developing the chemistry textbook for the third grade by including systemic intelligence skills.
- 2) Content analysis of the third intermediate grade book contributes to revealing its strengths and weaknesses.
- 3) To the knowledge of the two researchers, this is the first study in Iraq, which deals with the skills of systemic intelligence in the chemistry textbook for the third intermediate grade.

#### **Research Objectives:**

The research aims to: Analyze the content of the chemistry book for the third intermediate grade according to the skills of systemic intelligence.

#### **search limits :**

- 1) Cognitive limits, which are: Chemistry book for the third intermediate grade, fourth edition for the year 2019.
- 2) Time limits: the academic year (2022/2022 AD).
- 3) Objective limits: a list of systemic intelligence skills (9 main skills), which are: (Situational awareness, positive attitude, harmony and alignment, self-reflection, bearing the viewpoint, long-term systemic orientation, managing systems with oneself, managing systems with people, managing systems in general contexts)

#### **Define terms:**

**First - Content Analysis:** Define it:(Al-Zuwaini, and others, 2013): A set of technical methods and procedures designed to interpret and classify the study material, including written texts, drawings, images and ideas contained in the book.(Al-Zwaini and others, 2013: 106)

**Procedural definition:** The process of objective and quantitative systematic description of the content of the chemistry book for the third intermediate grade according to the skills of systemic intelligence, by adopting the explicit idea and the implicit idea as a unit of analysis, and repetition as a unit of enumeration, to find out the availability of these skills in the content of the science book for the third grade average intermediate for the academic year (2022). / 2021) AD

**Second: Systemic intelligence:** define it:Ranne (2007) defines it as "behavioural competence, which means acting intelligently with complex systems that include interactions and feedback." (Ranne, 2007, P: 1).

#### **theoretical background:**

##### **Content analysis concept.**

The analysis process follows in its work on descriptive criteria, and uses the organized scientific method, as the analyzed study material is characterized by objectivity in textbooks and work on interpreting the phenomena contained in the content. (Ghubari et al., 2015: 186)

It is considered as a regular quantitative description of a substance and is used in analyzing the content of many things, including books, documents, pictures, shapes, and others. (Al-Janabi, 2003: 19)

### **Content Analysis Features:**

- 1) Descriptive, which means an apparent description by specifying the features of the text's phenomena
- 2) Objectivity, which means moving away from subjectivity and looking at the subject itself.
- 3) Studying the content of the article, and there is no need to delve deeper into the writer's intentions or follow his intentions.
- 4) Quantification is a method based on quantitative assessment as a basis for the study and describing it with numbers instead of words (Al-Mutlaq and Yahya, 2014:59)
- 5) The process of content analysis depends on the scientific method, as the process of content analysis is a method of scientific research. (Zaytoun, 1992:201)

### **Content analysis steps:**

- ❖ A comprehensive review of the academic content.
- ❖ Knowing the number of units and main and sub-topics.
- ❖ Identify the facts, concepts, and skills for each of the psychological topics.
- ❖ Arranging topics according to an organized context, to suit the cognitive environment of the subject.
- ❖ Selecting a sample of the analysis, such as a textbook or an article in a scientific journal.
- ❖ The analysis process is carried out in the light of areas or skills.
- ❖ Determining the basic units of analysis such as word, paragraph, idea, whether implicit or explicit.
- ❖ Taking forms from tools for analysis, such as repetitions in tables or a questionnaire containing a set of paragraphs.
- ❖ Presenting and interpreting the results in the light of the curriculum document. (Alyan, 2010: 199)

### **systems intelligence**

Systemic intelligence represents the individual's ability to diagnose and know what to do during difficult situations in life, and we engage in reciprocal processes and share in situations, and allows them to adapt and succeed even in situations that are higher than their level of knowledge or limits of control, and that when we are at a degree From awareness of the characteristics of our systemic intelligence, it makes us able to take advantage of the latent and positive variables in the system. (hamalainen,Saarinen:2007:13)

Awareness of systemic intelligence changes our selves and our outlook, allows us to value our existing capabilities and encourages us to improve these capabilities. Awareness of the systems in which we live enables us to look at the world through a new lens. A lens that helps us to better interact with the world, and we can learn to interact with the systems. (hamalainen,Saarinen:2003:7)

### **Systemic intelligence**

Systemic intelligence makes us learn to live better and better. The biggest mistake is to think that we are isolated from the systems in which we live and that we have the ability to think independently when in fact we are closely connected to the environment around us and to others, and as a result, the possibilities for cooperation and sharing among all group members will be hampered It is exacerbated by the prevailing and dominant beliefs of the people. (hamalainen,Saarinen:2007:34)

### **Systematic intelligence skills:**

Hamalainen and Saarinen identified nine skills that constitute systemic intelligence, which are:

- 1) Situational awareness: It means the ability to perceive different types of life situations as distinct structures and permanently interconnected entities.
- 2) Positive attitude: It means a way to deal with situations, possibilities, contexts and events in a positive way.
- 3) Harmony: It means the ability to share influences between systems and be preoccupied with them in a self and joint manner.
- 4) Self-reflection: It means the individual's ability to think about his own motives, behaviors, ways of thinking and his own values.
- 5) Perspective taking: It means the ability to reflect and adopt new viewpoints and interpretations.
- 6) Long-term systemic orientation: It means the ability to perceive and address the escalating and long-term effects of complex reactions at the present time, i.e. providing an immediate response to rapid environmental changes and events.
- 7) Systems agency with oneself: It means the individual's ability to master himself (managing his mental and physical skills and abilities) as a comprehensive system.
- 8) Systems agency with people: It means successful leadership abilities in social situations and showing positive potentials with people.
- 9) System agency with general contexts: It means the ability to adapt and act successfully in diverse situations and contexts and complex environments. (Hamalainen&Saarinen,2007,p:821-825)

**Research Methodology and Procedures:**

**Research Methodology:** By relying on the descriptive analytical method to analyze the content of the chemistry book for the third intermediate grade, it is one of the well-known research methods. (Al-Mahdi, 2019: 208).  
**research community**

The population of this research consists of the chemistry book for the third intermediate grade in the Republic of Iraq for the academic year (2021/2022), which includes (4) chapters of the 2019 edition, as shown in Table (1).

The number of parsed pages	Number of pages excluded	Total N.O of pages	Book title	T
134	18	152	The content of the chemistry book for the third intermediate grade	1

**Research sample:**

Topics were selected from the chemistry book for the third grade, average sample for their research.

**Research tools:**

For the purpose of achieving the goal of the research, an analysis tool was built, according to which the content of the chemistry book for the third intermediate grade was analyzed, and it included a number of paragraphs (9) main and (32) sub.

**The objective of the analysis:**

is to show the extent to which the content of the chemistry book for the third grade includes an average of systemic intelligence skills.

**Units of analysis:**

Three units are usually used in content analysis, which are:

**1-Recording unit:** It is the smallest part of the analyzed content, including: the word, the subject, the paragraph, the idea, (Abd al-Rahman and Adnan, 2007, p. 213).

The (idea) has been used as a unit of analysis in the current research, and it is defined by (Al-Jadri and Yaqoub, 2009) as: a brief sentence or a brief phrase that includes the idea around which the topic revolves. (Al-Jadri and Yaqoub, 2009, p. 217)

The idea of amplitude is sufficient to give meaning, and it is small, which reduces the possibility of its inclusion in several directions, compared to units greater than it is for the unit of the subject, and the idea is of two types:

**A-** The explicit idea: It is the sentence in which it expressly and directly indicates the desire for something or the desire for it.

**B-** Implicit thought: It is a series of consecutive and successive psychological events and includes the following:

- 1) A situation or set of circumstances facing a particular person.
- 2) the behavior of the individual responds internally and externally.
- 3) The consequences of that behavior, whether physical, social, or internal.

The researcher relied on the explicit and implicit idea of a unit for recording, considering that the science books for the first and second intermediate grades and the chemistry book for the third intermediate grade are scientific books and their phrases are, in most cases, clear and explicit.

**2- Context unit:** the structure surrounding the recording unit that must be examined, including the paragraph or topic in which the idea is located. (Abd al-Rahman and Adnan, 2007, p. 214).

**3- Census unit:** repetition was used as a census unit to find out the idea in each indicator of the systemic intelligence skills indicator.

**Validity of the analysis tool:**

To verify the validity of the analysis by finding the validity of the analysis, through the assistance of an expert in the methods of teaching science, and this is done by conducting an analysis process for part of the original sample, as a random sample of the content represented by chapters from the chemistry book for the third grade average, chapter ( 3) From the book of chemistry for the third grade average intermediate (21) pages.

And according to the prepared standard, the recording unit (the explicit and implicit idea) was used, while following the steps of the analysis and being careful not to bias and presenting it to the two experts, who agreed on the validity of the analysis.

**Analysis stability**

**1- Consistency over time:** it means that the analyst or group of analysts obtain the same results if they analyze according to one classification for the same content at different intervals. Nautical, (202:2012 .)

As the analysis process was carried out after a period of time of (14) days, then the analysis process, as the value of the reliability coefficient was (98.14), and the reliability coefficient was calculated using Cooper's equation.

**Table N.O (1)**

Stability Coefficient Ratio	persistence between	Stability type
98,14%	researcher after 14 days	through time
97,64%	Between the researcher and the first analyst	via analysts
94,33%	Between the researcher and the second analyst	
96,61%	Between the first analyzer and the second analyst	

**Statistical means**

Percentage as an arithmetic method

$$P = \frac{NP}{NP + NNP} \times 100\%$$

Cooper's equation to calculate the stability of the analysis

**Presentation and interpretation of results**

**The results related to the objective** (What are the skills of systemic intelligence included in the content of the book / chemistry for the third intermediate grade? It showed that the skills of situational awareness ranked first in the chemistry book for the third intermediate grade, then came in the second place the long-term systemic orientation skill, the skill of the positive direction came third, and the fourth was the skill of bearing the face Looking, then the skill of managing systems with people fifth, then managing systems with oneself in the sixth order, then the seventh rank is the skill of managing systems in general contexts and self-reflection, and finally the skill of harmony or alignment ranked eighth, and therefore the book of chemistry for the third intermediate grade includes all the skills of systemic intelligence, but in varying proportions.

**Table No. (2) A comparison of the spoken percentages with the percentages of the results of the third grade book analysis, average**

spoken%	Percentage	main skill
9	19	situational awareness
12	16	positive trend
11	5	harmony or alignment
9	7	self meditation
10	12	bear the view
8	17	long-term systemic orientation

14	8	Managing systems with oneself
14	9	Managing systems with people
13	7	Systems management in general contexts

### Conclusions:

The chemistry book for the third intermediate grade includes all the skills of systemic intelligence in varying proportions.

### Recommendations and Suggestions:

- ❖ Achieving a balance in the skills of systemic intelligence in the chemistry textbook for the third intermediate grade.
- ❖ Urging the authors of chemistry curricula to include all the skills of systemic intelligence.
- ❖ Introducing chemistry teachers to systemic intelligence skills through holding workshops and seminars.

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