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# Content Analysis of the Sixth Scientific Grade Mathematics Textbook According to Mathematical Content Domains

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**Abstract**. *The present research aimed to:*

1- *Identify the mathematical content domains that should be included in the Sixth Scientific Grade mathematics textbook.*

2- *Determine the extent to which these domains are covered in the textbook.*

*To achieve these objectives, the researcher developed a list of mathematical content domains after reviewing relevant literature, studies, and previous research on mathematical knowledge and its components. An initial draft of the list was prepared, and its validity was verified through consultation with a panel of experts. The final version comprised four main components: concepts, principles and generalizations, skills, and problem solving. The researcher then analyzed the Sixth Scientific Grade mathematics textbook for the academic year 2024–2025. A total of 247 pages were examined, excluding introductory sections, questions, and indices. The analysis was conducted based on explicit ideas, with results recorded using frequencies and percentages, applying the descriptive method through content analysis. Reliability of the analysis was ensured through agreement between the researcher, external reviewers, and intra-rater consistency over time, using Cooper's formula as a statistical measure. Data were processed using the SPSS statistical package, employing measures such as percentages and Cooper's formula. The findings revealed that:*

- *The Sixth Scientific Grade mathematics textbook demonstrates a strong applied orientation, with a high emphasis on problem-solving compared to theoretical concepts.*

*Based on these findings, the researcher proposed several recommendations and suggestions, as presented at the end of Chapter Four.*

**Key words**: *content analysis, Sixth Scientific Grade mathematics textbook, mathematical content domains.*

**1.1. Problem of Research:** With the advancement of science and technology, and the emergence of institutions that rely primarily on creative intellectual production, our world today is witnessing an unprecedented information revolution across all fields of knowledge. The continuous flow of scientific discoveries and the resulting explosion of knowledge have had a profound impact on education. The curriculum, as the primary tool of education, plays a central role in achieving the goals of society.Updating and developing curricula is one of the most effective means to keep pace with the spirit of the age and to realize educational goals and aspirations. In the current era, the need to analyze the content of mathematics textbooks has become more pressing than ever, as curriculum authors must select content based on clearly defined educational objectives. Assessing the extent to which the content meets educational goals requires breaking it down into its components and quantitatively describing them. Numerous studies have been conducted to analyze mathematics

textbooks, either according to specific criteria or skills. Given the importance of mathematical content domains in analyzing the Sixth Scientific Grade mathematics textbook, and in the absence of any prior study—according to the researcher's knowledge—that examines this textbook in light of these domains, the researcher designed a questionnaire and presented it to 20 mathematics supervisors and teachers in Al-Qadisiyyah Governorate. Their responses were as follows:

- ✓ %71confirmed the absence of these components in mathematics textbooks.
- ✓ %86emphasized the necessity of including these components in mathematics textbooks.
- ✓ %59confirmed that mathematics teachers possess knowledge of the mathematical content domains.

Based on these findings, the research problem emerged, motivating the researcher to conduct an analytical study of the high school mathematics textbook to determine the extent to which it contains these components. The research problem can be summarized in the following question:

1- To what extent does the Sixth Scientific Grade mathematics textbook include the mathematical content domains?

**1.2. Research Importance:**Education is a fundamental tool for equipping learners with behavioral patterns that enable them to adapt positively to themselves and their society, and to cope with rapid changes and developments (Sweidan & Wahid, 2018, p. 33). The school curriculum is a central means of achieving the goals of education, providing learners with diverse experiences that contribute to building their holistic personalities inside and outside the school (Al-Jubouri, 2005, p. 7).In light of the accelerating changes and the massive flow of information, the teaching of thinking skills—particularly creative thinking—has become increasingly important. Creative thinking is accessible to all, differing only in degree among individuals (Hassan, 2014, p. 28).Accordingly, the significance of the present research can be summarized as follows:

1- It identifies the extent to which mathematical content domains are included in the high school mathematics textbook in accordance with recent curriculum developments.

2- It encourages researchers to analyze other mathematics textbooks, particularly at the primary level, in light of these components.

3- It may assist curriculum developers in improving high school mathematics textbooks by incorporating the main mathematical content domains.

**1.3. Research Goals:** The research aims to:

1- Develop a tool for analyzing the content of the Sixth Scientific Grade mathematics textbook based on mathematical content domains

2- Identify the extent to which the Sixth Scientific Grade mathematics textbook incorporates these components.

**1.4. Research Limits:**

1- Cognitive Limit: The Sixth Scientific Grade mathematics textbook (2024 edition).

2- Temporal Limit: The academic year 2024–2025.

**1.5. Definition of Terms**

**1.5.1. Content Analysis:**

- ➢ Al-Hashemi & Atiyah (2011) define it as: "A systematic process aimed at clarifying facts and specific concepts accurately by revealing the relationships between these components, thus facilitating their understanding and application" (Al-Hashemi, 2011, p. 175).
- ➢ Al-Zuwaini et al. (2013) define it as: "A set of technical methods and procedures specifically designed to understand the subject matter, including written texts, illustrations, images, and ideas contained in the book" (Al-Zuwaini et al., 2013, p. 106).

The researcher adopts the definition by Al-Zuwaini et al. (2013) as it aligns with the objectives of the study.

**Operational Definition (as adopted by the researcher)**: A research procedure used to analyze the content of the Sixth Scientific Grade mathematics textbook by breaking it down into concepts, facts, skills, and activities, then describing them accurately using quantitative methods, in light of the mathematical content domains adopted in this study.

### 1.5.2. School Textbook

- Al-Khawalda & Ismail (2014) define it as: "The official educational material provided by the authorities overseeing the educational process, used as a primary reference for teachers in organizing and delivering lessons, and as a key resource to support student learning and ensure their success" (Al-Khawalda, 2014, p. 31).
- Mohammed (2016) defines it as: "Material officially approved by the relevant educational authorities, addressing a specific subject in a particular sequence that reflects established educational objectives and philosophy, and used as a main source of information for a given educational level" (Mohammed, 2016, p. 67).

**The researcher adopts Mohammed's (2016)** definition of the school textbook, as it aligns with the nature of the research topic.

## 2. Theoretical Aspects and Previous Studies

**2.1. Content Analysis:** Content is considered one of the essential components of the textbook. It organizes knowledge and skills and helps improve its quality and elevate it to achieve the planned objectives. It is a set of methods and technical procedures designed to interpret and classify the educational material, including written texts, drawings, images, and ideas contained in the book (Al-Zouini et al., 2013, p. 105).Al-Mahmoudi (2019) defines it as a process through which the educational content developer examines the content from one aspect and considers the learner's cognitive ability, prior experience, and learning method from another aspect. The aim is to prepare the best approach for learning. The process seeks to identify the knowledge and information included in the content, organized in a way that corresponds to the characteristics of the learner (Al-Mahmoudi, 2019, p. 39).

### 2.1.1. Importance of Content Analysis

1- Assists researchers in scientific research to identify the study variables and understand their characteristics.

2- Plays a significant role in curricula by determining learning outcomes and content elements.

3- Enables comparison between what students actually study and what is intended.

4- Helps identify appropriate teaching and learning methods.

5- Important for pinpointing strengths and weaknesses in the textbook content.

6- Contributes to deriving instructional objectives.

(Tayimah, 2004, p. 31).

**2.1.2. Characteristics of Content Analysis:** Content analysis is a scientific research tool characterized by features that distinguish it from other sciences and methodologies. The most important of these are:

1- Descriptive Method: Description is a key trait of content analysis. It aims to describe and interpret the phenomenon as it occurs under predictable laws. The researcher classifies material into categories based on their features to extract general traits and then provide an objective and accurate interpretation. The researcher must remain neutral and accept the results.

2- Objectivity (Neutrality): Objectivity is essential in any scientific research, avoiding subjectivity and focusing on what serves the research. When a content analysis tool is said to be objective, it

means two things: validity—measuring efficiently what it is designed to measure, and reliability—giving consistent results if repeated by the same or different researcher.

3- Organizational Method: It involves setting a general framework during analysis where each category has its place, presented in a way that aligns with the study's goals and nature of the material. This includes preparing a clear and specific scientific plan to facilitate the researcher's work and demonstrate a scientific methodology.

4- Scientific Approach: Content analysis aims to study phenomena related to the content by applying laws to explain and explore relationships among them, reflecting the nature of scientific research.

5- Quantitative Method: It relies on quantitative estimation as the study's foundation, using mathematical and statistical methods to translate observations into numerical data, such as frequency of occurrence in the books under study. (Zaytoon, 2010, pp. 201-202).

**2.2. Fields of Mathematical Content:**

1- Mathematical Concepts: Researchers have differing opinions on their definition. Afana (2006, p. 10) defines a concept as "a set of common characteristics of mathematical content linked within a unified mathematical framework that forms the logical basis of the concept or its rule".

**2.2.1. Importance of Teaching Mathematical Concepts**

1- Helps learners classify, group, and simplify facts.

2- Assists in forecasting and planning all activities.

3- Enables learners to apply concepts in new educational situations without new learning.

4- Develops skills in organization, discrimination, linking, and identifying characteristics.

5- Aids in structuring and organizing cognitive and mental experiences.

6- Contributes to problem-solving when setting and choosing hypotheses using concepts.

7- Encourages self-learning.

(Sabri Radwan, 2011, p. 37).

**2.2.2. Classification of Mathematical Concepts:** Concepts can be classified based on several criteria:

- Descriptive vs. Denotative Concepts:

1- Descriptive Concepts: Indicate certain characteristics describing a group of objects (e.g., commutativity in sets).

2- Denotative Concepts: Indicate a specific entity distinguished by unique features (e.g., integer, odd number).

- Concrete vs. Abstract Concepts:

1- Concrete Concepts: Can be observed and relate to physical objects (e.g., square, circle, parallelogram).

2- Abstract Concepts: Cannot be observed directly and are non-sensory (e.g., function, rational number).

- Defined vs. Undefined Concepts:

1- Defined Concepts: Expressed verbally with reference to previously defined concepts (e.g., a square is a quadrilateral with all right angles.(

2- Undefined Concepts: Defined by some properties accepted without explicit definition (e.g., line, point, plane).

**Dienes (1960) classified concepts into:**

1- Mathematical concepts related to numbers and their relations.

2- Applied concepts related to applying number properties in real situations (e.g., time, length, weight).

3- Symbolic concepts related to numbers in terms of their properties and operations (Abu Zeina, 2003, p. 145).

**2.2.3. Mathematical Generalizations**: Defined by Shata (2010, p. 9) as a fixed relation between two or more concepts, including relationships, principles, laws, and theorems.Afana (2006) regards learning mathematics as learning generalizations, which are important parts of mathematics content as they link parts and contribute to the growth and development of the subject. Generalizations are a domain within mathematical content and relate to the definition of mathematical concepts as relations among two or more concepts. Studying generalizations fundamentally involves studying mathematical concepts (Afana, 2006, p. 250).

**2.2.3.1. Types of Mathematical Generalizations:** Generalizations can be classified into four types:

1- Axioms and Postulates: Accepted without proof, e.g., Pythagoras' theorem, or the statement that equal things subtracted from equals leave equals; or drawing a line between two known points.

2- Theorems: Mathematical statements proved using hypotheses, axioms, and stable facts that can only be changed by altering underlying concepts (e.g., divisibility rules.(

3- Laws: Types of generalizations expressed verbally, mathematically, or graphically, ranging from simple laws understandable via relationships between two concepts (e.g., distributive law) to more complex ones (e.g., probability laws.(

4- Mathematical Relations: Connections linking basic concepts to build higher ones, named by the number of variables: unary (one variable, e.g., naming geometric shapes) or binary (two variables, e.g., area of a circle) (Al-Bakri & Al-Kiswani, 2001, p. 120.(

**2.2.4. Mathematical Skills**: These are important parts of mathematics content at all educational stages. Defined as the ability to perform mathematical operations quickly, accurately, and with understanding, using rules or stepwise algorithms (Abu Zeina, 2010, p. 283).

**2.2.4.1. Classification of Mathematical Skills**

1- Quantitative skills: e.g., reading, writing numbers, performing arithmetic operations, measurements.

2- Performance skills: e.g., solving word problems requiring translating practical or mathematical situations into relations or procedures.

3- Qualitative skills: e.g., accurately expressing concepts and mathematical symbols by understanding qualitative concepts and expressing them in mathematical language.

4- Shape-related skills: e.g., knowledge of properties and terminology of geometric shapes.

5- Practical skills: e.g., using geometric or measuring tools for shapes (Rasras, 2011, pp. 358-359).

**Al-Kubaisi (2008, p. 94) offers another classification:**

1- Motor and performance skills: e.g., using a protractor to measure or draw known angles.

2- Sensory-motor skills: e.g., drawing geometric shapes with specified measurements using tools.

3- Various computational and algebraic skills: e.g., factoring, extracting square and cube roots.

4- Visual skills: ability to recognize different geometric and spatial shapes.

5- Verbal skills: naming geometric and mathematical shapes.

6- Classification skills: identifying similarities and differences between shapes.

**2.2.5. Mathematical Problems and Exercises**: A mathematical problem is a new mathematical or real-life situation encountered by the learner, requiring solving using previously learned mathematics. Problem-solving is the learner's activity in linking information and problem data to move toward a solution (Al-Sharif, 1996, p. 69).

**2.2.5.1. Levels of Mathematical Problems:**

1- Level One (Exercises): algebraic expressions applying laws and rules directly.

2- Level Two: word problems solved by applying a rule or method.

3- Level Three: word problems not solvable directly by rules, requiring thinking, analysis, or devising new solution methods; used to measure understanding.

4- Level Four: the highest level, called mathematical problems, which contributed to math's development and expansion of its applications (Gonzalez, 1994, p. 77).

**2.2.5.2. Importance of Problem Solving:** Serves as a means to apply concepts, generalizations, and skills in new contexts.

1- Develops thinking patterns and skills.

2- Helps students face and solve daily life problems.

3- Stimulates students' curiosity and challenges them to reach solutions.

4- Trains students in learning new knowledge and vocabulary during problem-solving.

**2.2.5.3. Strategies for Solving Mathematical Problems:** Some strategies include:

1- Pattern search: understanding data to find a key or rule for the solution.

2- Working backward: starting from the final data moving backward to the initial data.

3- Organizing data into tables to facilitate reaching solutions.

4- Trial and error: guessing intelligently, learning from mistakes to get closer to the solution; estimation skill is important here (Al-Absi Abbas, 2009, p. 103).

**2.3. Previous Studies:**

**2.3.1.** Rihaan et al. (2015) analyzed mathematics textbooks for grades five and six based on knowledge components using a descriptive-analytical method. Statistical tools included percentages and frequencies to determine content domains. Results showed 1120 content domains for grade five and 805 for grade six.

**2.3.2.** Matti (2016) analyzed the first intermediate grade mathematics textbook according to mathematical content fields (concepts, generalizations, skills, problems) using a descriptive-analytical approach and paragraph or idea unit as the analysis unit. Results indicated that mathematical concepts constituted 13.53%, skills 21.09%, generalizations 7.15%, and exercises and problems 58.23%.

**2.3.3.** Al-Jalabi (2020) analyzed the first intermediate grade textbook content according to creative thinking skills using descriptive-analytical methods with paragraph or idea unit as the analysis unit. Results revealed varying low percentages for creative thinking skills: flexibility, fluency, and inference were 64.8%; expansion and hypothesis formulation 30.2%; prediction 5%.

**2.3.4. General Commentary on Previous Studies**

All previous studies aimed to analyze the mathematics content of middle-stage textbooks except Rihaan et al. (2015), which focused on fifth and sixth elementary grades. They all employed a descriptive-analytical methodology consistent with the current study and provided guidance on building study tools, appropriate statistical methods, and scientific interpretation of results.

## 3. Research Procedures

**3.1. Research Methodology:** The researcher relied on the descriptive-analytical method in this study to analyze the content of the sixth scientific grade mathematics textbook. Content analysis is considered one of the important survey methods to reveal the extent of focus on content analysis (Ahmed & Al-Hammadi,1987,p.364).To ensure that content analysis is objective and systematic, it is necessary to define data sources, research tools, analysis units, counting units, and clear explicit rules for the analysis method (Banks, 1971, p. 95) .

**3.2. Research Population:** This study included the content of the newly authored sixth scientific grade mathematics textbook for the academic year 2024–2025, 12th edition, with a total of 247 pages and six chapters. Defining the research population is an important methodological step in educational research, requiring great accuracy, as the research process, design, and result accuracy depend on it (Shafeeq, 2001, p. 184)

**3.3. Research Sample:** Conducting a comprehensive study of the entire population requires considerable time, effort, and financial cost. Therefore, the researcher selects a representative sample from the population to achieve research objectives and facilitate task completion. The sample should represent the population in size (Abu Zaidah, 2018, p. 158). The sample consists of:

1- The content of the sixth scientific grade mathematics textbook for the academic year 2024–2025, with 247 pages analyzed after excluding introductory pages, questions, and indexes.

**3.4. Research Tool:** A tool is necessary for this study to analyze the content of the sixth scientific grade mathematics textbook according to the content analysis method used by the researcher (Holisti, 1969, p. 95). To build this list, the researcher followed these steps:

**3.4.1. Determining the main skills of the tool**: The researcher prepared a list of the mathematical content domains to be included in the sixth scientific grade textbook, passing through the following phases:

- ✓ Reviewing relevant studies on mathematical content domains.
- ✓ Examining books and literature addressing mathematical content areas.

**3.4.2. Formulating the analysis tool paragraphs**: The researcher constructed a preliminary list including four main domains of mathematical content.

**3.4.3. Face validity of the analysis tool**: This refers to the overall appearance of the test in terms of item type, phrasing, and clarity (Majid, 2014, p. 102). The list was presented to a group of arbitrators and specialists in teaching methods and educational psychology to evaluate the tool's validity and its components. After achieving an agreement rate of 80% among the judges, minor adjustments were made.

**3.5. Content Analysis of the Sixth Scientific Grade Mathematics Textbook:** To analyze the textbook content, the following were defined:

**3.5.1. Purpose of Analysis**: To determine the extent to which the mathematical content domains constructed by the researcher are included in the sixth scientific grade mathematics textbook.

**3.5.2. Analysis Units**: The researcher used the following units in the analysis process:

- ✓ **Recording or coding unit**: The smallest part of the analyzed content used to diagnose what is intended from the content (Abdulrahman & Adnan, 2007, p. 21)
- ✓ **Explicit and implicit idea unit**: The researcher used this as the recording unit to analyze the textbook content because it is most suitable for the research method and has these features :
- ➢ Larger than the word unit and smaller than the topic unit.
- ➢ Widely used in content analysis studies.
- ➢ Large enough to convey meaning but small enough to reduce the possibility of containing multiple values (Suleiman, 2014, p. 187).

**3.5.3. Analysis Steps**: The researcher followed these steps to analyze the textbook content:

- ✓ Reading the entire textbook carefully to control the analysis.
- ✓ Reading each line carefully a second time to identify ideas included in each topic.
- ✓ Matching each idea in the topic with the indicator in the research tool and recording frequencies.
- ✓ Transferring analysis results into a table by assigning a frequency count for each indicator derived from the ideas (Alam, 2022, p. 951.(

**3.5.4. Rules and Principles Used in Analysis**: The researcher relied on several rules, including:

- ✓ Using the idea unit in analysis, considering any text between a line head and comma or period as an analyzable idea.
- ✓ If an idea lacks a clear meaning due to its relation to preceding or following text, the previous or next idea is referred to for clarification.
- ✓ Excluding introduction, index, and end-of-chapter questions to focus on textbook content as relevant to the research.
- ✓ Treating main ideas containing subsidiary ideas as independent sub-ideas.
- ✓ Treating conjuncted ideas as independent, each counted separately.
- ✓ If a sentence contains two or more ideas related as cause-effect or means-end, treat them as a single idea.
- ✓ When two inseparable ideas appear in one phrase, the stronger idea is chosen for analysis (Al-Khawalda & Yahya, 2014, p. 139).

**3.5.5. Validity of Analysis**: The validity procedures are similar to those used in other research methodologies to ensure tools measure what they are designed to measure (Al-Jadri & Abu Helu, 2009, p. 217). Validity was confirmed by presenting a sample of the analyzed material (chapter three, differentiation) to three experts in mathematics teaching methods who agreed on the analysis suitability, which the researcher considered as validity of the analysis.

**3.5.6. Reliability of Analysis**: Reliability refers to the independence of information from the measurement tools, meaning consistent results should be obtained under the same conditions, categories, analysis units, and time samples regardless of who performs the analysis or when (Al-Abed & Azmi, 1993, p. 224). Content analysis reliability measures the agreement among coders or analysts regarding content elements or the same analyst's agreement with themselves when repeating the analysis after some time (Al-Dabaa, 2006, p. 278). The researcher used two types of reliability:

- ✓ Test-retest reliability: The researcher repeated the analysis thirty days after the first.
- ✓ Inter-rater reliability: Agreement between the researcher and other analysts independently analyzing the same content following the same procedures (Al-Hashimi & Atiyah, 2014, p. 228).

To ensure this, the researcher collaborated with other analysts, agreed on analysis procedures, and calculated agreement percentages between the analyses using Cooper's formula, as shown in Table (1).

**Table (1): Reliability Coefficients of the Analysis**

| Type of Reliability | Reliability Raters | Reliability Coefficient(%) |
|---|---|---|
| Test–retest reliability | Researcher with himself after 30 days | %90 |
| Inter-rater reliability | Researcher with first rater | %88 |
| | Researcher with second rater | %90 |

The table indicates that the reliability percentage was high, as Al-Imam et al. (1990) pointed out that a reliability value exceeding 70% is considered good (Al-Imam et al., 1990: p. 167).

**3.5.7.** Determining the Criterion Percentage Adopted by the Researcher for the Analysis Results:The researcher adopted a 70% benchmark for comparing the analysis results, based on:

- A study addressing the domains of mathematical content, in which 70% was considered a hypothetical benchmark for textbook analysis.
- The agreement of reviewers and experts on 70% as a hypothetical benchmark for comparing the analysis results. The researcher distributed a questionnaire to determine the percentage, and the experts' agreement reached 100%.

**3.5.8.** Statistical Methods: The researcher employed a variety of statistical methods using the Statistical Package for the Social Sciences (SPSS, version 21) and Microsoft Excel to process the results, except for percentages and frequencies used for the content analysis results and Cooper's formula.

**4. Presentation and Interpretation of Results:** This chapter presents the results obtained from the research, interprets them, and discusses them in light of its objectives, as follows:

**4.1. Results of the First Objective:** To determine the extent to which the mathematics textbook for the Sixth Scientific Grade incorporates the domains of mathematical content, the researcher utilized a checklist of these components as a tool for textbook analysis. The analysis results were first presented individually, followed by the overall results of the textbook analysis, as follows:

- Presentation of the Content Analysis Results of the Mathematics Textbook for the Sixth Scientific Grade – 12th Edition (2024) The results of analyzing the domains of mathematical content are shown in Table( 2). The total number of analyzed pages in the textbook was 247 pages.

**Table (2): Frequencies and Percentages of the Mathematical Content Domains in the Mathematics Textbook for the Sixth Scientific Grade**

| Chapters | First | Second | Third | Fourth | Fifth | Sixth | Total |
|---|---|---|---|---|---|---|---|
| | Complex Numbers | Conic Sections | Applications of Differentiation | Integration | Ordinary Differential Equations | Spatial Geometry | 6 |
| Number of pages per chapter | 41 | 41 | 61 | 61 | 19 | 24 | 247 |
| Percentage of each chapter relative to the total number of pages in the book | %16 | %16 | %24 | %24 | %7 | %9 | 100 % |
| Number of lessons | 18 | 18 | 48 | 36 | 18 | 12 | 150 |
| Percentage of each chapter relative to | %12 | %12 | %32 | %24 | %12 | %8 | 100 % |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| the total number of lessons | | | | | | | |
| Concepts | 9 | 9 | 6 | 5 | 3 | 10 | 42 |
| Generalizations | 24 | 21 | 8 | 20 | 2 | 11 | 86 |
| Skills | 20 | 11 | 25 | 21 | 4 | 11 | 92 |
| Problem solving | 76 | 25 | 38 | 76 | 18 | 17 | 250 |
| Total | | | | | | | 470 |

Considering Table (2), the total repetitions of the mathematical content domains included in the Sixth Scientific Grade mathematics textbook reached (470). Problem-solving recorded the highest number of repetitions (250), accounting for (53.19%), while concepts had the lowest number of repetitions at (42), representing (8.93%). From these results, it is observed that the content of the Sixth Scientific Grade mathematics textbook gave significant attention to problem-solving, while skills, generalizations, and concepts received less focus. There is a clear imbalance in the inclusion of mathematical content domains within the textbook. The results revealed the book's weakness in engaging students with components that develop their interpretation, understanding, and proof skills, which reflect on their cognitive achievement.

**4.2. Conclusions:**

1- Problem-solving recorded the highest frequency of 250 times, approximately (53%) of the total components, reflecting a strong emphasis on application and procedures. This is positive in terms of training students but insufficient alone without deepening the concepts.

2- Skills ranked second with 92 repetitions, approximately (19%), indicating that students are expected to master advanced mathematical procedures such as differentiation, analysis, limits, and integration.

3- Generalizations appeared 86 times, about (18%), which weakens the inductive mathematical structure.

4- Concepts were the least frequent with 42 repetitions, roughly (8%), a very low percentage that does not align with the importance of consolidating basic concepts at this final stage.

This distribution shows that the book excessively leans towards procedures and problem-solving at the expense of interpretation, understanding, and theoretical mathematical framing. This pattern may produce a student capable of solving problems but weak in explaining their actions or relating them to real-life or further academic applications. The first chapter was among the strongest in content, while the sixth chapter (probabilities) appeared to be the weakest in all components, which may weaken preparation for university-level statistics.

**4.3. Recommendations:** In light of the procedures followed and the research results obtained, the researcher recommends the following:

1- Curriculum planners and developers should pay attention to the domains of mathematical content and incorporate them adequately, with the Ministry of Education adopting the current era's vision that fundamentally relies on curricula.

2- Teachers at the preparatory stage should emphasize mathematical content domains in their teaching.

3- Organizing training courses for preparatory stage mathematics teachers to enhance their professional levels in teaching mathematical content domains, ensuring the effective use of these components in their lessons.

4- Achieving balance in the mathematics textbooks for the preparatory stage regarding the inclusion of mathematical content domains.

**4.4. Suggestions:** Building upon the current research outcomes, the researcher suggests conducting the following studies:

1- A similar study including other subjects such as physics and chemistry across various educational stages.

2- A study to measure the levels of mathematical content domains among mathematics teachers at the preparatory stage

**The References**


1. Abdulrahman, Anwar Hussein Waznaka, Adnan Haqi (2017): Methodological Patterns and their Applications in Human and Applied Sciences, Al-Wifaq Printing Company, Baghdad, Iraq.
2. Abu Zayda, Hatem (2018): Scientific Research Methodologies, 1st ed., Future Research Center, Gaza, Palestine.
3. Abu Zina, Farid Kamel, Abdullah Youssef Abayana (2010): Development and Teaching of School Mathematics Curricula, 1st ed., Wael Publishing and Distribution, Amman.
4. Afana, Azo Ismail (2006): Strategic Teaching of Modern Mathematics, Al-Miqdad Printing and Publishing, Gaza.
5. Ahmed, Shukri, and Abdullah Al-Hammadi (1987): Methodology of Content Analysis and its Applications in Education, Educational Research Center, Vol. 19, Qatar University.
6. Al-Abd, Atef Adli, and Azmi, Zaki Ahmed (2007): Statistical Methods and their Uses in Opinion and Media Research, 1st ed., Dar Al-Fikr Al-Arabi, Cairo, Egypt.
7. Al-Absi, Mohamed Mustafa, Abbas, Mohamed Khalil (2009): Methods and Strategies of Teaching Mathematics, 1st ed., Dar Al-Maseera, Jordan.
8. Al-Bakri, Amal, and Al-Kaswani, Afaf (2010): Methods of Teaching Science and Mathematics, Dar Al-Fikr, Amman.
9. Al-Dab'a, Mahmoud (2006): Educational Curricula: Their Manufacture and Evaluation, 1st ed., Anglo Library, Cairo, Egypt.
10. Al-Hashimi, Abdulrahman and Atiyah, Mohsen Ali (2011): Curriculum Content Analysis, 2nd ed., Dar Safa for Publishing and Distribution, Amman, Jordan.
11. Al-Imam, Mustafa Mahmoud, et al. (1990): Measurement and Evaluation, 1st ed., Al-Hikma Publishing House, Baghdad, Iraq.
12. Al-Jadri, Adnan Youssef, and Yaqub Abu Abdullah Abu Hilu (2009): Methodological Foundations and Statistical Uses in Educational and Human Sciences Research, Athari University Library for Publishing and Distribution, 1st ed.
13. Al-Jubouri, Saad Jowaid Kazem (2005): Effectiveness of Educational Historical Films and Illustrations in the Achievement of Fifth Grade Female Students in Arabic Islamic History, Unpublished Master's Thesis, University of Babylon, College of Basic Education, Iraq.
14. Al-Khawalda, Nasser Ahmed, and Ismail, Yahya (2014): Content Analysis in Curricula and Textbooks, 1st ed., Zamzam Publishers and Distributors, Amman, Jordan.
15. Allam, Salahuddin Mahmoud (2022): Educational Research (Competencies for Analysis and Applications), 1st ed., Dar Al-Fikr for Publishing and Distribution, Amman, Jordan.
16. Al-Mahmoudi, Mohamed Sarhan Ali (2019): Scientific Research Methodologies, 3rd ed., Dar Al-Kitab, Sana'a, Yemen.
17. Al-Sharif, Ahmed Al-Arefi (1996): Introduction to Mathematics Teaching, 1st ed., Open University, Tripoli.
18. Al-Zuwaini, Ibtisam, et al. (2013): Curricula and Book Analysis, 1st ed., Dar Al-Safa for Publishing and Distribution, Amman, Jordan.

19. banks ،J.A content analysis of the black American in textbook in james ،A.B teaching social studies to cultorally different children ،new york ،Addison ،wesley 1971.
20. Gonzalez ،G.R. descriptive study of verbal problem in selected mathematics text book at high school ،Dis.bs.mt.Vol.54، NO90 ، 1994.
21. Hassan, Hanaa Rajab (2014): Thinking, Learning Programs and Measurement Methods, 1st ed., Arab Complex Publishing and Distribution Library, Amman.
22. Holsti ،C.R. content analysis for the social science and humanities ،new york ،Addison ،wesley 1969.
23. Majid, Sousan Shaker (2014): Foundations of Psychological and Educational Tests and Measures, 3rd ed., De Bono Thinking Center, Amman, Jordan.
24. Mohamed, Shaker Jasim (2016): Social Studies, its Curricula, and Teaching Methods and Strategies, 1st ed., Al-Sadiq Cultural Foundation, Babel, Iraq.
25. Rasras, Hassan Rashad (2011): Alternative Conceptions of Mathematical Concepts among Tenth Grade Students, Al-Azhar University Journal, Vol. 13, No. 2, Palestine.
26. Sabri Ridwan (2007): Using Learning Cycle to Teach Some Mathematical Concepts and its Effect on Cognitive Achievement, Learning Retention, and Developing Fourth Grade Students' Inclination towards Mathematics, PhD Dissertation, South Valley University.
27. Shafiq, Mohamed (2001): Scientific Research for Preparing Scientific Studies, 1st ed., Al-Kitab Center for Publishing, Cairo.
28. Shata, Saeed Mohamed (2010): A Proposed Strategy in Light of Davis Model for Acquiring and Retaining Mathematical Generalizations among Tenth Grade Students in Gaza, Unpublished Master's Thesis, Islamic University, Gaza, Palestine
29. Suleiman, Abdulrahman Said (2014): Research Methodologies, 1st ed., Alam Al-Kitab, Cairo, Egypt.
30. Sweidan, Souad Humaidi, Wahid Abdulkarim Mohsen Al-Zuhairi (2018): Modern Trends in Teaching in Light of Scientific and Technological Development, 1st ed., Amman, Jordan.
31. Taima, Rushdi (2004): Content Analysis in Human Sciences, Dar Al-Fikr Al-Arabi, Cairo, Egypt.
32. Zaitoun, Ayesh Mahmoud (2010): Contemporary Global Trends in Science Curricula and Teaching, 1st ed., Dar Al-Shorouk, Amman, Jordan.