

Analysis of mathematics books in the basic education stage according to TIMSS standards

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ABSTRACT

The current research aims to identify the inclusion of international tests standards TIMSS-2015 in mathematics books for the basic education stage of the fourth primary (basic) and intermediate second (eighth basic) grades in the Republic of Iraq. The researcher used the descriptive and analytical approach in the content analysis method. The content of mathematics books scheduled for the basic education stage the research tools were cards for content analysis and to determine the extent to which the research objectives were achieved, a preliminary list of TIMSS-2015 standards was adopted, which was adopted in the study (Tabaza, 2018). (The basic eighth) in its two parts (the first and second), and a sample of the analysis sample was presented to a number of arbitrators, and it was agreed on the validity of the paragraphs and to ensure the consistency of the analysis in two ways, the first is the researcher with himself and the second the researcher with other analysts after a specific period of time has passed and I got an agreement that ranges from Between (88% - 97%), as the data and ratios were processed in stability using the Holsti equation, and the results were reached, there is agreement in most of the criteria, because all irrigation books Notes were prepared according to TIMSS-22015 standards, according to these results a number of recommendations were made, including: Taking the results and employing them in developing mathematics books to rise with the content of mathematics books in other developed countries according to the international tests TIMSS-2015. Mathematics in basic education stages in light of the requirements of international studies TIMSS-2015.

Keywords

book analysis, TIMSS standards

First: The research problem:

Textbooks are the source of knowledge, so it needs continuous development to achieve its goals, and content analysis is one of the most important methods of its development, as content analysis is one of the methods of scientific research. (Do you think do you include mathematics textbooks for the fourth primary (basic) and second intermediate (eighth basic) grades of TIMSS international standards?) Attached to a copy of it and the answer is: (85%) of the math teachers surveyed do not have an identifier for the term (TIMSS) , And that the Association (NCTM) recommended the necessity of including TIMSS standards in mathematics curricula primarily in building curricula and ensuring the achievement of these standards by students, as they are based on organized observation available for research by all people, and there is much that can be discovered in terms of the behavior of things and their relationships The interlaced, analogy is an important characteristic in most branches of modern science, because its formulation and establishment is much

easier when using the description. (Abu Athera, 2013: 90) Hence the research problem can be identified with the following questions:

- 1 - Are the standards of (TIMSS-2015) achieved in the mathematics textbook for fourth-grade students (basic) in the content area (numbers, geometric shapes, measurements, and data presentation)?
- 2 - Are the standards (TIMSS-2015) achieved in the mathematics textbook for intermediate second grade (eighth basic) students in the content area (numbers, algebra, geometry, data and probability)?
- 3 - Are the standards of (TIMSS-2015) achieved in the mathematics textbook for students of the fourth grade of primary and intermediate (eighth basic) in the field of cognitive levels (knowledge, application, and inference)?

Second: The importance of the research: The first theoretical aspect: The importance of the theoretical aspect is as follows:

1- The importance of TIMSS standards as a goal of education.

2- This research is the first of its kind in Iraq (to the best of the researcher's knowledge and acquaintance) that researches the international tests standards TIMSS included in the content of the mathematics curriculum decided for students of the basic education stage.

The second applied aspect: The importance of the practical aspect is as follows:

1- This research lends itself to others to study the extent to which TIMSS standards are included in the mathematics curriculum

2- This research provides information for teachers on the TIMSS international test standards available in mathematics textbooks for the basic education stage, which may guide the teaching, guidance, counseling and evaluation processes.

Third: Research objectives: The current research aims to:

1- Learn about the standards (TIMSS) in the mathematics book that is scheduled for fourth grade students (basic) in the field of content (numbers, geometric shapes and measurements, and data presentation).

2- Knowing the (TIMSS) standards achieved in the mathematics textbook for intermediate second (eighth basic) students with its two parts (first and second) in the content field (numbers, algebra, geometry, data and probability).

3- Recognizing the standards (TIMSS) achieved in mathematics textbooks for students of the fourth grade (basic) and intermediate second (eighth basic) in the field of cognitive levels (knowledge, application, and inference).

Fourth: Research Limits: This research is limited to:

Mathematics books for the fourth primary and second intermediate grades, second edition, 1440 AH / 2019.

Fifth: Defining terms:

Content analysis: It was defined by: Muhammad and Muhammad (1991) as: "the ability to disassemble matter into its components and parts in order to understand its organizational structure" (Muhammad and Muhammad, 1991: 96).

- The book: (Muhammad, 1990) states: "Written texts designed for classroom use, carefully prepared by experts specializing in a field of knowledge and equipped with useful educational aids" (Muhammad, 1990: 291).

- TIMSS international test standards: defined by:

Al-Faris (2014) as: (a type of international examination in mathematics and science to improve student learning in these two subjects, and aims to focus on educational policies and systems, study the effectiveness of applied curricula and methods of teaching them, scientific application of them, evaluation of achievement and providing information to improve and learn mathematics and science) (The Knight, 2014: 7)

- The stage of basic education (2012) as: "A nine-year education that is in line with modern educational trends, the requirements of contemporary life and the needs of development, striving towards expanding the base of basic education, bridging the sources of illiteracy, providing the learners and taking into account their characteristics and the demands of their growth in this educational phase that extends from age (6-15).

The first axis: theoretical aspects: First: content analysis

The concept of content analysis: Educational scientists and researchers differed in the methodology of the research about the concept of analysis, and this difference is classified into two

different categories: First category: Content analysis considers that it aims at accurate and objective description, and some of them believe that it aims at quantitative classification of a specific content, while others see it as a classification of the features of tools. The intellectual in the categories and among them: Abdel-Baqi (1974): he believes that content analysis from his point of view is a method and a tool for objective, structured and quantitative description of the apparent content of communication and that it is used in depicting the existing social, economic and political conditions in society. (Abdel-Baqi 1974: 52). The second category: They are the ones who confused the concept of content analysis with other concepts such as content analysis or the documentary approach (Salem, 1983: 45)

Characteristics of content analysis: - A description method: that is, an analysis is used to describe something, and the description is the interpretation used to determine the meaning of the phenomenon. Objectivity: that the topic is as it is, and not through relying on other factors such as personal analyzes. And organization: is the application of analysis from through relying on the use of a scientific plan that contains an explanation of its hypotheses, through which the categories used in the analysis, its steps and results are determined. A quantitative method: that is, content analysis relies on estimating the quantities (numbers) in order to use them as a basis for studying the content. Content, which contributes to law-making and the use of form. Objectives of content analysis:

It is possible to talk about the analytical approach by reviewing the following scientific methods: the deconstructive method, and the deductive method, but the intended methodological steps in the content analysis approach and their own, are as follows:

- 1- Classification of the researched contents.
- 2- Analysis of the units of analysis.
- 3- Designing the analysis form.
- 4- Designing the discharge tables.
- 5- Filling out the content of each document with its own form. 6- Applying the

necessary statistical treatments, both descriptive and analytical.

- **Characteristics and advantages of mathematics:** Mathematics is the language of science, as it represents information in precisely defined terms and symbols, mathematics is an art, and uses different mental operations. Mathematics varies between the use of lower and higher mental processes. It is a universal language and is based on a mathematical structure, organized in sequence, and has practical applications in all aspects of life

Mathematics content: The mathematics content can be classified into four basic elements: concepts, generalizations, and skills - problem solving. These elements are not separate from each other. Rather, they are in their entirety an integrated construction of mathematics. Concepts are the basic building blocks of this construction.

- The importance of studying mathematics: Mathematics is the path to thinking for this world, for it is the language in which the natural sciences speak, as it depends entirely on the precise language and mathematical logic and mathematics has features in terms of content and method, which makes it an excellent field for training students in patterns of ways of thinking. The sound is a good tool for interpreting life situations and thus it is a great aid to understanding the life around us and it has wide applications in public life.

Mathematics is characterized by accuracy and clarity, and it serves the growth, scientific development and technology (Al-Nafeh, 2002)

Objectives of Teaching Mathematics:

1 - That students become familiar with the language of mathematics and its characteristics and the role that symbols play in providing language, accuracy and clarity.

Individualizing education, organizing education, and improving education. 2- That students use the language of mathematics to express their ideas and communicate them to others accurately, clearly and easily. 3- That students develop their

ability to logical thinking and mathematical proof and use this in understanding problems and solving them.

The school book: The textbook is the main pillar of education, and it represents the applied aspect of the educational curriculum, and it is the moving spatial framework that carries a picture of the educational curriculum with all its objectives, content, activities, and methods of evaluation.

The importance of the textbook: Objectives of using the textbook: It enriches and enhances the learners' learning and helps the learners to understand the psychological, logical and conceptual environment of the material and takes into account the individual differences between the learners

Branches of the textbook: Mathematics and arithmetic, which is one of the basic subjects that includes algebra, geometry, statistics, trigonometry, calculus, and integration, and scientific subjects, which include biology, chemistry, physics, earth sciences, environment and social studies.

The second axis - TIMSS standards, in this axis the researcher will deal with the concept of the term TIMSS down to the TIMSS-2015 standards in the textbook of mathematics in the stage of basic education in Iraq. The term TIMSS is an abbreviation for (Trend of the international Mathematics and Science Studies), which means international trends to assess Trends in knowledge of student achievement in science and mathematics. (Mullis & other, 2007: 3)

Objectives (TIMSS)

1- Qualifying the student to enter the next era, so that he has a scientific culture to keep pace with development, interact with it and creativity through it.

2- Linking and integrating topics (numbers, geometric shapes, measurement, and data presentation) for the fourth grade (basic) and subjects (numbers, algebra, geometry, data and probabilities) for the second intermediate grade

(eighth basic) from the side of scientific inquiry and on the other side for cognitive processes.

3- Identify the validity and suitability of the curricula content in the participating countries with the global situation according to the standards set by the International Trends for Mathematics and Science (TIMSS). (Tabaza 2018: 155)

The importance of (TIMSS): To familiarize students with applying all mathematical and scientific concepts and providing them with mathematical and scientific skills that depend on the method of thinking and analysis, developing methods of evaluation and effectiveness of formative evaluation and measuring the acquired skills, forming a qualitative and comprehensive database on all stages in which the educational process takes place.

TIMSS standards tools: (Mullis et al., 2007) mentioned the tools used to define TIMSS standards, namely:

A- Research Questionnaires: Student Questionnaire, (Teachers Questionnaire, School Questionnaire, Curriculum Questionnaire)

B- Exam notebooks

Research methodology: The researcher followed the descriptive and analytical approach in analyzing mathematics books using the content analysis method in light of TIMSS-2015 standards.

Research community and its sample: The current research community is represented by all the topics included in the content of mathematics books applied within the mathematics curriculum in the schools of the Republic of Iraq for the academic year (2020-2021) from the books of the fourth grade of primary (basic) and the second intermediate grade (eight basic) consisting of the first part and the part The second, which represents the current sample for the research. Research tools: Use the content analysis card, as the researcher created a content analysis card based on TIMSS-2015 standards. The analysis

card was composed of two dimensions, namely the content dimension and the knowledge dimension for each of the fourth primary and intermediate grades.

Research steps: First: Building the content analysis card, Second: Controlling the analysis card.

After the fourth grade mathematics content: the main criteria (numbers, geometric shapes, measurements, and data presentation

After the content for the second intermediate grade (main criteria (numbers, algebra, geometry, data and probabilities)

After cognitive processes: It is divided into three sub-domains:

1- The field of knowledge that includes (6) levels (remembering, distinction, classification, calculation, importation, measurement).

2- The field of application and it includes (3) levels (identification, representation, implementation).

3- The field of inference, which includes (6) levels (analysis, integration, evaluation, deduction / conclusion, generalization, justification).

Analysis procedures: determining the purpose of the analysis, determining the sample of analysis, specifying the categories of analysis, specifying the units of analysis, and specifying the units of registration.

Validity of the consistency of the content: In order to ensure the validity of the analysis tool, the content card was presented to a number of specialized arbitrators from methods of teaching mathematics, and for the purpose of ascertaining the validity of the list, if the percentage of agreement on this list reached (95%), which is a good percentage indicating agreement on Standards.

Stability of the analysis: In order to find the coefficient of reliability, an agreement was made between the researcher and himself when re-analyzing the process after a period of time or

calculating the stability in consistency with other individuals, and the Holsti equation was statistically adopted to find stability.

The researcher has adopted, in processing the research data, statistical means, the statistical reality (spss).

Interpretation of the results: The main question is: Are the TIMSS-2015 standards achieved in the mathematics books prescribed for students of the fourth primary (basic) and intermediate second (eighth basic) levels in the Republic of Iraq?

The first axis: Presentation of the results: The results related to the first question: Are the TIMSS-2015 standards achieved in the mathematics textbook scheduled for fourth-grade students in the Republic of Iraq in the content area

To answer this question, the content of the mathematics textbook for the fourth grade of primary school was analyzed

First: the field of numbers

1) There are (21) criteria in the field of numbers out of (24) standards with percentages ranging between (0.06% -19.81%), as it was found that there is a discrepancy in the percentage of achieving each of these criteria in the mathematics book for the fourth grade.

2) We did not find some standards in the mathematics book for the fourth grade in the fields of numeracy content, which are:

Subtract and add decimals, and use specific relationships in well-defined patterns.

3) The criterion of (skills of multiplication and division) came within the field of natural numbers in the first order in terms of verification rate of (19.81%), followed by the criterion of (recognizing the value of each number) with a verification rate of (12.20%) and the criterion of (expression of numbers) Verbally, in the third order, with a verification rate of (11.02%).

While the criterion (the use of symbols and graphs to represent the numbers) came in the last place with a percentage of (0.06%).

Second: The field of geometric shapes and measurements:

1- The number of standards for the content of geometric shapes and measurements that have been achieved in the mathematics book for the fourth (basic) grade has reached (8) standards out of (9) standards, with rates ranging between (1.01% -25.59%), which indicates There are varying percentages in meeting each of these criteria. And in the first order came with a percentage of (25.59%), a standard (measuring length and estimating it), then a standard (determining and drawing angles of all kinds) with a verification rate of (24.24%), then a standard (estimating storage units, such as: a full cube) in the third order with a verification rate of (18.52 %), While the criterion came in the last order (calculating the meters close to areas and polygons: (cuboid, cubic, cylinder, cone)) with a rate of (1.01%).

Third: The field of data presentation

1- The number of data presentation content standards that have been achieved in the fourth-grade mathematics book have reached (4) standards out of (7) criteria, with ratios ranging between (6.06% -57.58%). There was a difference in achieving the percentages for each of these criteria.

2- The criterion (drawing conclusions by conducting sequences on the basis of data "came in the first order with a percentage of (57.58%) and in the second order came standards (using data presentation to answer questions) and (performing calculations using data by combining two or more sources) in equal proportions. It amounted to (18.18%), while the criterion (husbands reading the data) came in the last place with a percentage that ranged from (6.06%).

Discussing the results related to the question (Are the TIMSS-2015 standards achieved in the mathematics book scheduled for fourth-grade students in the Republic of Iraq in the field of content, and the answer to this question was by analyzing the content of the fourth-grade mathematics book according to TIMSS-2015 standards. Presentation of the research results The

researcher noticed the achievement of all content areas in the mathematics book for the fourth grade of primary school in the Republic of Iraq, and the percentage of results was variable, as the percentage of the number area in the mathematics content of the fourth primary (basic) grade was (81.61%), which is in the first order, then came the field of geometric shapes The measurements are in the second place with a rate of (18.84%) and the field of data presentation came in the last order with a rate of (1.83%).

1- The field of preparation: The total percentage of the field of preparation has reached (81.62%), which is higher than that of the international standards TIMSS-2015 which is (50%), and the researcher believes that the field of regular and decimal fractions is in line with the international standards TIMSS-2015 As for the natural numbers, it must Work on adding, deleting or modifying some parts of it.

2- The field of engineering and measurements: its percentage reached (16.52%), which is less than its percentage compared with the percentage of international standards TIMSS-2015, which is (35%). The researcher attributes the reasons for the decline to the book's restriction to only two semesters.

3- Data display field: its percentage is (1.83%), which is a very small percentage when compared with the ratios of TIMSS-2015 standards.

The researcher believes that this field is of little percentage because the mathematics book does not include the fourth graphic representation

Results related to the second question: Are TIMSS-2015 standards achieved in the mathematics textbook for fourth grade students in the Republic of Iraq in the field of cognitive levels?

First: The field of preparation:

The number of knowledge level standards are (6) standards, all of which have been achieved in varying proportions, and the percentages ranged between (4.41% -34.96%). The criterion (perform the four arithmetic operations or a combination of

these operations on integers, decimal and ordinary fractions, and algebraic operations) came in the first order with a percentage that amounted to (34.96%) and in the second order came a criterion (remember terms, definitions, characteristics of numbers, engineering properties and units of measurement) with a percentage that has reached (20.23%), and in the third order came the criterion (importing information from graphs, tables, texts and any other sources) with a percentage that amounted to (17.70%), and in the last order came a standard (using appropriate tools and units of measurement) with a percentage that amounted to (4.41%).

Second: The field of application:

The number of standards for the level of application in mathematics writing for the fourth grade of primary school, of which there are (3) standards, all have been achieved in varying proportions, and the ratios ranged between (26.38% -42.68%) and it was found that the standard (implementation of strategies and processes to solve problems related to concepts) Mathematical practice) came in the first order with a rate of (42.68%), while the second ranking came in the standard (choosing appropriate and effective processes and strategies for solving problems so that they form an algorithm or method for solving problems) with a percentage that amounted to (30.94%).

While in the last order came a standard (display of data in diagrams, geometric graphs, inequalities, numbers, equations or diagrams for a problem solving model, as well as an equivalent representation of the mathematical form) with a percentage that amounted to (26.38%).

Third: Inference:

All the criteria for the level of inference were fulfilled at varying rates ranging between (2.38% - 36.19%). It is evident from the table that the criterion (providing data representing more general relationships) came in the first order with a percentage that amounted to (36.19%) and in the second order came a criterion (Linking the different elements of knowledge and related data and using them to solve problems) by a

percentage that amounted to (20%), while the criterion for determining or describing the use of relationships between formulas, numbers, and quantities forms) came in third place with a percentage that amounted to (16.19%). (Provides mathematical supports to support a strategy or solution) by (2.38%).

Discussing the results of the second question: "Are the TIMSS-2015 standards achieved in the mathematics textbook for fourth-grade students in the Republic of Iraq in the knowledge field (knowledge, application, and inference)?

Then the answer to this question is by analyzing the cognitive domain in the mathematics textbook in the fourth (basic) grade of primary school according to TIMSS-2015 standards.

By presenting the results of the research, the researcher noticed the achievement of all areas of the cognitive dimension in the mathematics book for the fourth (basic) grade in the Republic of Iraq, which included (knowledge, application, and inference) according to TIMSS-2015 standards. It is in the first place and the field of application came in second place with a rate of (12.92%), and the field of inference came in the last place with a rate of (8.84%), as shown below:

1- The field of knowledge: The knowledge field includes (6) criteria (remembering, distinction, classification, calculation, import, measurement) as this field came in the first order with a percentage that amounted to (78.24%), while the percentage of TIMSS-2015 standards reached (40). % Which is high.

2- The field of application: This field includes (3) criteria, namely (identification, representation / model, and implementation) as this field came in second place with a rate of (12.92%), while its percentage according to TIMSS-2015 standards reached (40%). A very small percentage by international standards.

3- The field of inference: This field includes (6) criteria which are (analysis, merging, evaluation, drawing, conclusions, generalization, justification), as this field came in the last rank with a rate of (8.84%), while its percentage

reached international standards TIMSS- 2015 (20%), and this percentage is considered low.

Results related to the third question

The third question: Are the TIMSS-2015 standards in the mathematics textbook established for intermediate second (eighth intermediate) students in the Republic of Iraq in the content area (numbers, algebra, geometry, data, probabilities)?

To answer this question, the content of the mathematics textbook for the second intermediate grade (eighth basic) was analyzed according to TIMSS-2015 standards

First: The field of numbers 1- Achieving (16) standards in the field of numbers out of (20) criteria, ranging between (0.08% -30.42%). It was also found that there is a discrepancy in the percentage achieved in each of these criteria in the mathematics book for the second grade average (The basic eighth) .2 The content of numbers in the mathematics book in its two parts (first and second) in the Republic of Iraq did not take into account the following four standards, which are included in the international standards TIMSS-2015:

3- The criterion (employing arithmetic operations on ordinary fractions and decimal fractions in solving problems) came in the first order with a percentage that has been achieved (30.42%), and the criterion (conducting arithmetic operations on fractions, decimals and integer numbers) came in the second order by a percentage that amounted to (20.12%) Then it was followed by (determining the numbering powers) in the third order by a percentage that amounted to (16.08%). The latter rate has reached (0.08%).

Second: The field of algebra 1- The number of algebra content standards that have been achieved in the mathematics book for the second grade, intermediate (eighth basic) are (8) standards out of (14) criteria, with ratios ranging (0.09% -43.76%) and this means that there is no balance in the ratios Achieved for each of these criteria 2- The content of algebra in the mathematics book in its two parts (first and second) in the Republic of Iraq (6) criteria - criterion (solving linear equations in

two variables) within the field of algebra (equations and inequalities criterion) generalization of the pattern of relations, in the field of algebra Series (within the field of algebra) relationships and conjunctions (criterion) knowing the missing number in series (within the field of algebra) relationships and conjunctions (criterion) writing the new pattern using numbers, words and algebraic formulas in series (within the field of algebra) relationships and conjunctions (standard) determining linear and non-Linearity and contrast, extracting properties of associations from tables and graphs) within the field of algebra (relationships and conjunctions) criterion (interpretation of meanings of intersection and slope in graphs) within the field of algebra (relationships and conjunctions)

3- The criterion (find the product of addition, multiplication and division) came in the first order with a percentage that has been achieved (43.76%), then in the second order came the criterion (solving linear equations) with a percentage that amounted to (23.74%), and in the third order came the criterion (solving linear inequalities) with a percentage It reached (12.69%), while the criterion (comparison between algebraic formulas) came in the last place with a rate of (0.09%).

Third: the field of engineering presentation

1- The number of engineering content standards that have been achieved in the mathematics book for the second grade, intermediate (eighth basic) are (10) standards out of (13) standards, with proportions ranging (0.16% -30.67%), which indicates a lack of balance in the ratios achieved for each One of these criteria.

2- The geometry content in the mathematics book in its two parts (first and second) in the Republic of Iraq did not take into account the three criteria, which are:

- Standard (renewal of the line of symmetry) within the field of engineering (geometric shapes)
- Standard (knowing the relationship between two-dimensional shapes and their three-

dimensional counterparts) within the field of geometry (geometric shapes)

Standard (two-dimensional engineering transformations) within the field of engineering (location and movement).

3- The criterion (determining the location of points on the coordinate plane) came in the first order with a percentage that has been achieved (30.67%), then followed by the criterion of (the use of geometric transformations (withdrawal, rotation, reflection)) in the second order with a percentage that amounted to (14.68%), then came Standard (choosing the appropriate measurement formulas and using them to calculate perimeters, areas, surface areas, volumes and measuring compound areas) in the third order by a percentage that amounted to (14.36%), while the criterion (using the characteristics of the quadrangular circular shape and its symmetric measurements) came in the last order by a percentage that has exceeded (0.16%).

1- The number of data content standards and probabilities that were achieved in the mathematics book for the second grade, intermediate (eighth basic) are (9) standards out of (10) criteria, with ratios ranging between (0.46% - 17.70%), which indicates a lack of balance in the ratios achieved For each of these criteria.

2- The data content and probabilities are not taken into account in the mathematics textbook for the second grade average (eighth basic) in the Republic of Iraq in its two parts (first and second) for one criterion only, which is (organizing the presentation of data so that it does not lead to misunderstanding) within the field of data and probabilities (interpretation of data).

3- The criterion (the use of data in estimating the probability of future outcomes) came in the first place with a percentage that amounted to (17.70%), then followed by the criterion (the probability uses special products in solving problems and determines the probability of possible outcomes) in the second order with a percentage that amounted to (17.47%) Then, the criterion (calculating the arithmetic mean, the range, mode and the form of the distribution)

came in the third order with a percentage that amounted to (15.86%), while the criterion (deduction, extraction and estimation of the values from the given data) came in the last order with a percentage that amounted to (0.46%).

Discuss the results related to the third question

To answer the third question (Do you achieve the TIMSS-2015 criteria in the mathematics textbook for second-grade intermediate (eighth intermediate) students in the Republic of Iraq in the field of content (numbers, algebra, geometry, data, probabilities)?

By displaying the results of the research, the researcher noticed the achievement of all content areas in the mathematics book for the second intermediate grade (eighth basic) in its parts (first and second) in the Republic of Iraq, which includes (numbers, algebra, geometry, data and probabilities) according to TIMSS-2015 standards, and the percentage of results varied. - Number field: This field includes (natural numbers and their percentage (15.48%), regular and decimal fractions and their percentage (21.95), percentage and proportion and percentage and their percentage (0.41%)).

The international standards TIMSS-2015 did not give the percentage of each division of the field of numbers, as the percentage of the field of numbers reached (37.57%), which is a rather large percentage compared to the percentage of international standards TIMSS-2015 which is (30%).

The researcher believes that it is a somewhat acceptable ratio of what is included in the content of mathematics books for the second intermediate grade (eighth basic) and the nature of the academic content, which focused heavily on mathematical operations and routine issues, and perhaps the interest of the book's authors is due to the volume of educational content at the expense of other content journals.

2- The field of algebra: This field includes the following: (formulas and processes and their ratio (15.84%), equations and inequalities and their percentage (13.43%), and relationships and

correlations and their ratio (1.96%)). The international standards TIMSS-2015 did not give a percentage for each division of the field of algebra if the ratio of the field of algebra was (31.23%), which is a very reasonable percentage because it is close to the ratios in the international standards TIMSS-2015.

3- Engineering field: This field includes the following: (geometric shapes and its percentage (3.93%), engineering measurement and its percentage (3.63%), location and movement and its percentage (10.69%)).

The international standards TIMSS-2015 did not give a percentage for each division of the field of engineering, as the percentage of the field of engineering was (18.25%), which is close to the percentage of the international standards TIMSS-2015 and the results of the analysis indicate that the field of concentration of engineering content in mathematics books for the second intermediate grade (the eighth) The main focus is on the topic of position and movement related to representing points on the Cartesian plane and making geometric transformations on shapes with the proportions of geometric proportions converging with the subject of geometric shapes. The researcher believes that the percentage of geometry in the content of the mathematics book in the second intermediate (eighth basic) is acceptable compared to its ratio for international standards TIMSS-2015.

4- The field of data and probabilities: This field includes the following: data characteristics and their percentage (4.17%), the interpretation and percentage of data (2.62%), and the probabilities and their percentage (6.16%).

The international standards TIMSS-2015 did not give a percentage for each division of the data field and probabilities, as the percentage of the data field and probabilities was (12.95%), which is less than the percentage of international standards TIMSS-2015 (20%).

The researcher noted that the data content and probabilities focused on the topic of probability estimation, while the book ignored the issues of interpreting data from criteria (organizing the

presentation of data when it does not lead to misunderstanding) and (deducing, extracting and evaluating the values and data given).

The results of the question, the fourth question, the fourth question: Are the TIMSS-2015 standards achieved in the mathematics textbook for intermediate second-grade students (the eighth basic) in the Republic of Iraq in the field of knowledge (knowledge, application, inference)?

First: knowledge

1- It is clear from Table (24) that the number of knowledge level standards are six standards, all of which have been achieved in varying proportions, and the percentages ranged between (0.05% - 40.22%).

2- The criterion of "remembering terms, definitions, characteristics of numbers, geometric properties, and units of measurement" in the first order was (40.22%), and in the second trial came standard (perform the four arithmetic operations or a combination of these operations on integers, decimal and ordinary fractions, and algebraic operations) With a percentage that amounted to (29.06%), then it is followed by the standard (importing information from graphs, tables, texts and any other sources) with a percentage that amounted to (16.34%), and in the last order came a standard (using appropriate tools and units of measurement) with a percentage that amounted to (0.05%), then Standard "classifies numbers, quantities, formulas, and common characteristics of shapes" with a percentage of (0.27%)

Second: Application 1- The number of application level standards are (3) standards, all of which have been achieved in varying proportions, and the ratios ranged between (11.75% -44.81%). 2- The criterion (implementation of strategies and processes to solve problems related to familiar mathematical concepts) came in the first instance With a percentage that reached (44.81%), in the second ranking, a criterion (choosing appropriate and effective processes and strategies for solving problems in order to form an algorithm or method for solving problems) with a percentage that reached (43.44%) And in the last arrangement came the criterion (displaying data in diagrams,

engineering graphs, inequalities, numbers, equations or diagrams for the problem solving model, as well as the equivalent representation of the mathematical form) with a rate of (11.75%).

Third: Inference 1- The number of criteria for the level of inference are (6) standards, and all of them have been achieved with varying rates ranging between (1.12% -44.57%). 2- The criterion (defining or describing the use of relationships between formulas, numbers, and quantities) came in the first order with a percentage of It amounted to (44.57%) and in the second order came the criterion (making conclusions correct based on information and evidence) at a rate that amounted to (26.96%). The last ranking came as a criterion (availability of mathematical supports to support a strategy or solution), at a rate of (1.12%).

Discussing the results of the fourth question: an answer to the fourth question "Are the TIMSS-2015 standards in the mathematics textbook prescribed for intermediate second (eighth basic) students in the Republic of Iraq in the field of knowledge (knowledge, application, inference)

1- The field of knowledge: This field includes (6) levels, which are (remembering at 19.47%, excellence at 6.81%, classification at 0.13%, calculation at 14.06%, import rate of 7.92%, measurement rate of 0.02%). The researcher noted that international standards TIMSS-2015 did not give a rating for each level of the knowledge domain.

We note that the knowledge domain percentage of (48.41%) is higher than its percentage in the international standards TIMSS-2015, which is

2- Scope of application: This field includes (3) levels, namely (determination of 19.95%, representation / model rate of 5.38%, implementation rate of 20.54%). We note that the international standards TIMSS-2015 did not give an evaluation rate for each level of the field of application. The percentage of the field of application was (45.81%), which is close to its percentage in the international standards TIMSS-2015, which is (40%).

3- The field of inference: This field includes (6) levels, which are (analysis at a rate of 2.57%, consolidation rate of 0.41%, evaluation rate of 1.03%, drawing and conclusion rate of 1.55%, generalization rate of 1.03%, justification rate of 0.06%) and we note that international standards TIMSS-2015 did not give an evaluation rate for each level of the field of application.

Recommendations:

1- Taking the results of this research and employing them in developing mathematics books to upgrade the content of mathematics books in other developed countries according to TIMSS tests.

2- Include TIMSS requirements for pre-service teacher preparation programs and in-service training programs.

Proposals:

1- Conducting a comparison of mathematics books for the basic education stage in the Republic of Iraq and mathematics books for developed countries in the results of the international study TIMSS.

2- Conducting research in analyzing the content of mathematics textbooks for grades preceding the second intermediate grade (eighth basic) in basic education.

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