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The Compatibility of the Statistics and Probability Unit in the Mathematics Books for the Basic Stage in Palestine with the International Standards (NCTM 2014)

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ABSTRACT

This study aims to analyze the content of statistics and probabilities in mathematics textbooks in Palestine to find out the extent to which (NCTM 2014) standards have been met for the purpose of developing them. which is a method used in addition to other methods to evaluate the curricula in order to develop them. The study population represented by the content of the statistics and probability units in the mathematics books for the basic stage in Palestine, while the sample of the study is represented by the unit of the statistics and probability unit in the mathematics book of the seventh grade in Palestine.

The research results show that the main criterion of mathematical correlation in statistics and probability obtained the highest frequency within the main standards of statistics and probability in mathematics books for the seventh grade, and the main criterion of inference and proof in statistics and probabilities ranked last among the main standards of statistics and probabilities in mathematics books for the seventh grade. Based on the results the researcher recommends which There should be an enhancement of standards for reasoning and proof in the seventh-grade curriculum, this can be achieved by providing more opportunities for critical thinking, building arguments. There is a need to develop standards for mathematical representation in the curriculum to include the use of information and communication technology (ICT) to expand students' representation capabilities and the use of multiple modes such as oral, written, pictorial, and visual.

Keywords: content analysis, statistics and probability, mathematics textbook, seventh grade.

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Introduction

Mathematics is a universal language which use is included in all areas of human life, the need for it began since the existence of man on this earth, and it will continue to play a fundamental role in the development of human civilization through conducting calculations, processing data, communicating with others, solving problems, making decisions and dealing with other sciences. The educational process is currently witnessing a wide development process in its various aspects, and its goal is to catch up with modern global developments. Mathematics textbooks, being among the primary instructional materials used in most schools, must keep pace with these innovations in daily life.

The process of reviewing, analyzing, and evaluating academic curricula is a continuous, permanent, and never-ending process, especially in light of the rapid and successive developments that we are witnessing at the present time. This is because the curricula and what emerges from them in terms of school curricula and learning materials are opportunities for learning to occur among the learners, and the curricula constitute the basic building block for individuals to deal with recent developments in light of a rapidly changing world in a way that allows them and their society to benefit from the available knowledge and material experiences and capabilities which makes keeping up process very difficult (Alfred et al, 2010).

Many countries in the world have paid attention to international standards, including the standards issued by the National Council of Teachers of Mathematics in the United States of America, which represented in content standards: preparation and operations, algebra, geometry, measurement, data analysis and probabilities, and in operations standards: problem solving, mathematical thinking, mathematical communication, mathematical interdependence and mathematical representation to develop Mathematics books. Therefore, the necessary arose to analyze textbooks, and see their compatibility with international standards to develop their content at all stages and what accompanies them, and to each new one in order to modify its path and reach sound mathematics books with few errors in order to improve the educational process and carry out the development process continuously (Ebeid, 2010).

Problem of the study

The teaching of statistics and probability depends on a clear, coherent progression of concepts and skills across grade levels, as stipulated by the National Council of Teachers of Mathematics (NCTM, 2014). These standards emphasize the deliberate distribution, organization, and integration of key ideas throughout the curriculum so that learning unfolds logically and builds upon itself within and across units of study, thereby equipping learners with a deep understanding of data analysis, interpretation, and evidence-based decision making.

In Palestine, the textbook serves as the primary vehicle for translating the official curriculum into classroom practice, relied upon by teachers, students, and supervisors

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alike. Despite its central role, no systematic investigation has yet examined whether the statistics and probability units in primary-stage mathematics textbooks align with NCTM's standards for problem solving, connections, communication, representation, and reasoning and proof. This gap raises the question of whether the local content achieves the desired balance among these five dimensions or mirrors the shortcomings documented in other Arab and international contexts.

For example, Al-Badri (2022) found high conformity (up to 39.4 %) between conceptual and procedural knowledge in middle-school algebra texts but very low coverage (< 3 %) of historical development standards. Elsayed (2021) reported that technology-related representation indicators appeared in fewer than 2 % of the ninth-grade Omani textbook items. Alabdulaziz (2021) observed strong links to real-life applications but weak attention to reasoning and logical methods in Saudi textbooks. Haji (2019) demonstrated that verbal and written representations deepen understanding yet noted limited opportunities for students' written justification. Abdel-Aal (2018) highlighted the dominance of problem-solving activities over written proof in Jordan's seventh-grade book. Huey and Weber (2018) further pointed to U.S. secondary teachers' lack of readiness to teach statistical inference, underscoring a global gap in cultivating inferential skills through the curriculum.

Accordingly, this study's problem centers on determining the extent to which the statistics and probability units in Palestinian primary-stage mathematics textbooks comply with NCTM (2014) standards—particularly in problem solving, connections, communication, representation, and reasoning and proof—and on identifying whether local strengths and weaknesses correspond to those documented elsewhere. A precise analysis of these dimensions is essential for pinpointing areas of strength and deficiency and for formulating evidence-based recommendations for curriculum development.

Research Questions

1. To what extent does the statistics and probability content in Palestinian primary-stage mathematics textbooks reflect NCTM (2014) standards overall?

2. What is the degree of representation of the problem-solving standard within this content?

3. What is the degree of representation of the mathematical connections standard within this content?

4. What is the degree of representation of the mathematical communication standard within this content?

5. What is the degree of representation of the mathematical representation standard within this content?

6. What is the degree of representation of the reasoning and proof standard within this content?

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Significance of the study

The importance of this study gains from the importance of the textbook occupies, the importance of mathematics itself, the importance of the subject of statistics and probabilities, the analysis of its content through mathematics books, and the importance of the standards of the National Council of Teachers of Mathematics (NCTM). This importance is evident as follows:

- On the theoretical field, this study is focus on the compatibility of the statistics and probability unit in the mathematics books for the basic stage in Palestine with the international standards. This is an innovative research because we didn't find any research dealing with the analysis of the content of statistics and probabilities of mathematics books for the basic stage in Palestine according to international standards (NCTM2014).

- On the practical field, directing the attention of planners and developers of mathematics curricula in Palestine to the strengths and weaknesses in the content of statistics and probability in mathematics textbooks for the basic stage.

- On the research field, it sheds light on recent trends in the development of mathematics curricula through NCTM 2014 standards, and thus opens the door for researchers to further studies in this field.

In light of the above, this study attempts to achieve the following objectives:

1. Analyze the content of the statistics and probability unit in the diferent mathematics books for the basic stage in Palestine with the international standards (NCTM2014).

2. Determine the level of (standard statistics and probability, problem-solving, mathematical correlation, and mathematical communication standard) in the content of statistics and probability in mathematics books for the basic stage in Palestine?

Methodology

Due to the nature of the study, the researcher used the descriptive method by following the method of content analysis, which is a method used in addition to other methods to evaluate the curricula in order to develop them. The results of this process, in addition to the results obtained through other methods, are indicators that determine the direction of development later on.

Therefore, this approach was used in this study to describe the content of statistics and probabilities in mathematics books for the basic stage in Palestine to see their compatibility with international standards, and it depends on the standards set by the National Council of Teachers of Mathematics in the United States of America (NCTM 2014), where the researcher analyzed the statistics and probability unit in the mathematics book for the seventh grade in Palestine, which is one book approved by the Ministry of Education in Palestine for the year 2022-2023.

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Population and sample of the study

The study population comprises the Statistics and Probability units as they appear in all basic-stage mathematics textbooks officially approved by the Palestinian Ministry of Education. The sample for detailed content analysis is the Statistics and Probability unit in the Grade 7 mathematics textbook, the one I use in my own classroom as a Grade 7 teacher.

The study assumes that:

There is no compatibility between the content of statistics and probability in mathematics textbooks for the primary stage in Palestine and the standards in the document (NCTM 2014).

Previous studies

Al-Badri (2022) discusses whether the algebra content suggested in middle school mathematics texts is in line with global standards (NCTM, 2014). For this, the research was descriptive-analytic to answer the research questions. The study examined previously available middle school mathematics texts and the related educational studies. Accordingly, the researcher developed an analysis tool (analysis card) in line with algebraic standards pointed by NCTM (2014), which include five broad areas/process standards and 43 indicators: algebraic notation (9 indicators), equations (7 indicators), equation representation (16 indicators), equation pattern changes (7 indicators) and historical development and perspectives of algebra (4 indicators). The mathematics education specialists validated the accuracy of the tool. The next step was the analysis of the algebra content presented in the middle school mathematics textbooks for 2020/2021. It embraced statistical averages and standard deviations in data analysis, which showed in the first year of MIDDLE SCHOOL that the algebraic notation had the maximum conformity (34.7%) with the international standards (NCTM, 2014), while for historical development of algebra the minimum was at 2.6%. In the second year, the most aligned was with 39.4% changes in patterns of equations; the least had an alignment of 1.2% - historical development of algebra. For the final year, the highest alignment at 39.1% was generated by algebraic notation, while the lowest with 3.5% was from historical development of algebra. The research recommendations to improve alignment included alignments to standards as well as other standards not included in NCTM (2014) and updated textbooks of recent developments in mathematics teaching.

The Elsayed (2021) study presents the incorporation of National Council of Teachers of Mathematics (NCTM) standards in textbooks for the basic education of Oman. A descriptive-analytical method was used, employing content analysis with a tool composed of 43 indicators based on four NCTM standards related to geometry, after testing for validity and reliability, the study investigated ninth-grade mathematics textbooks for the academic year 2018/2019 in geometry units, 5 total units across two semesters, the analysis was conducted at the topic level, with paragraphs as a recording unit, using criteria and indicators as analysis categories, the frequencies and

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percentages of indicator inclusion in the textbooks were calculated. The results indicated a poor incorporation of NCTM standards and indicators in the ninth-grade mathematics textbooks of Oman, especially for some indicators, which was very weak or nil. The study recommended the advancement of mathematics curriculum in Oman, especially the textbooks, in order to comply with international standards in mathematics education and the values and goals of Omani society.

Alabdulaziz, (2021) research this was a result of analyzing the compatibility of the developed mathematics textbook content in Saudi Arabia with the standards of NCTM. The research involved an analysis of the extent to which developed mathematics textbooks in the Kingdom of Saudi Arabia (KSA) met the standards of the National Council of Teachers of Mathematics (NCTM) in the United States of America (USA) between 2013 and 2019. The proposal aims to collect and synthesize these recommendations through comparing methodology, sample size, grade levels, number of NCTM standards covered, and results of the analyses. Additionally, the purpose of the review is to identify areas in the mathematics curriculum that address only a small percentage of NCTM standards according to these studies so that stakeholders can use this information to help improve these curricula. It is suggested for further research to assess the content of the developed mathematics textbooks for classes not included in these studies such as primary grades 1 to 2 and secondary grades 2 to 3. It has been observed that the mathematics curriculum for the first-year secondary school recorded a low coverage of the NCTM standards.

Haji, (2019) expand the comprehension of mathematical concepts through the application of the Principles and Standards of the National Council of Teachers of Mathematics (NCTM). According to the research methodology employed, which is descriptive, results yield indications that mathematical concepts can be understood through the application of NCTM Principles and Standards, which constitute six major principles: Equity, Curriculum, Teaching, Learning, Assessment, and Technology. The following comprise the developed understanding of mathematical concepts: (a) verbal and written expression of concepts, (b) examples and non-examples, (c) different symbolic representations of a concept, (d) several forms of a representation, (e) identifying a concept's properties, (f) compare ideas, and (g) understanding.

The Al-Hasban (2018) survey focused on how closely the algebra contents in school mathematics books at the basic stage in Jordan are compatible with the national standards (NCTM, 2014). The algebra portion of the mathematics textbooks allocated to ninth and tenth grades in Jordan was analyzed using a descriptive research design aimed at describing how the algebra content allocated to ninth and tenth grades in Jordan matches national standards. The results indicated that the most topics in agreement with the national standards in the ninth grade book is the field of algebraic notation, followed by the field of patterns of change in conjunctions, while the results of the tenth grade showed that the two topics that most agree with the categories and types of algebraic conjunctions are the categories and types of national standards.

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Abdel-Aal (2018) study gives an analysis of the content of the seventh-grade mathematics book of basic education in Jordan in light of the problem-solving criterion according to the standards of the National Council for Teachers of Mathematics (NCTM). The tools of analysis were based on the NCTM criteria. The outcome of the study showed that the sub-criterion "to use problem-solving methods to understand the mathematical content" came first among the sub-criteria of the problem-solving criterion from the view of frequency in activities and examples. While the sub-criterion "to develop and use different strategies to solve mathematical problems" ranked last in frequency among the sub-criteria of the problem-solving criterion in activities and examples.

Finally, there was the Huey and Weber (2018) study about how secondary mathematics teachers varied their strategies on inferential reasoning tasks. Proceedings of the Tenth International Conference on Teaching Statistics. The sample of this study consisted of 49 mathematics teachers from secondary schools, well versed in the areas of probability and statistics. Results showed that the average mathematics teachers in America are not adequately equipped to teach statistics and probability. Results also indicated that teachers need to know random methods in order to teach statistical inference properly and that they need more experience to gain confidence and skills necessary.

After reviewing the previous studies of our environment, whether at the local, Arab or foreign level, the researcher can conclude the following:

- Many previous studies dealt with the standards of the National Council of Teachers of Mathematics (NCTM), and this indicates that Arab and foreign studies paid attention to the study of standards.

- The current study agrees with previous studies in that its subject matter is analyzing the content of mathematics books according to the standards of the National Council of Teachers of Mathematics.

Analysis Units

The analysis unit is the unit that refers to the feature that the research looking for, and in this study it is: mathematical connection, mathematical representation, mathematical reasoning and proof, mathematical communication, and mathematical problem solving. The unit may be the sentence, the question, or the term denoting any of these standards, and it may include in mathematics books:

1. Each activity contained in the content (explanation of the mathematical topic): this related to what the writer raises from a problem or a question within the life and lasts of the other, which is not life, which is the student, through his dealings and interaction with this activity, to reach one of the elements of the content, or a solution, or a solution.

2. Each example contained in the presentation of the content (explanation of the mathematical subject) is intended to provide an application of the concept,

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generalization, algorithm, or mathematical skill, or a presentation of a solved mathematical issue.

3. Training.
4. Each activity listed under (Think).
5.Exercises and problems.
6. Revision.
7. Self-test.

Analysis procedures and steps

The researcher followed the following methodology in analyzing the content of the mathematics book for the seventh grade of the Palestinian curriculum:

1. The researcher examined the content of mathematic book for the seventh grades.

2. The content of each book was analyzed separately, so that the statistics and probability unit was divided into lessons, and each lesson was divided into paragraphs, where each activity and example contained in the content was considered training, and each activity included under the item (Think), exercises, questions, and self-review. units for analysis.

3. In the event that the criterion is available in one paragraph, a sign (/) is placed in the space provided, according to the presence of each criterion in the analysis list, and then the frequencies mentioned in all paragraphs of the statistical unit and probabilities are collected for each of the criteria, and so on.

4. Duplicates are unloaded from the analysis lists to other tables, prepared for this purpose, so that (frequencies and percentage) are given to express the degree of fulfillment of each criterion in seventh grades book.

5. Calculating the percentage of the main criterion using the Microsoft excel program to achieve each criterion through the total number of frequencies in the mathematics book.

6. The percentage of achieving the sub-criterion was also calculated. How much was the analysis process reviewed several times to ensure that the analysis process and the percentage calculation was done correctly?

7. The results have been unpacked into tables; in order to determine the availability of the standards of the National Council of Teachers of Mathematics (NCTM 2014) to obtain the final result of the analysis process.

Results of the study

The results of the main question:

What is the compatibility level between the content of statistics and probability in mathematics textbooks for the primary stage in Palestine and the standards in the document (NCTM 2014)?

To answer this question, the frequencies and percentages of the NCTM standards found in the content of statistics and probabilities were calculated in the Mathematics Book for the seventh grade in Palestine, and Table (1) shows that:

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Table (1) frequencies and percentages of subjects related to (NCTM-2014) standards in statistics and probabilities in the seventh grade mathematics book

NUM	Standard	Repetition	%
First: the criterion for solving the mathematical problem in statistics and probabilities			
1	The content allows building new mathematical knowledge in statistics and probabilities through the problem solver.	29	28.43
2	The content provides routine problems in statistics and probability.	25	24.51
3	The content provides non-routine problems in statistics and probability.	19	18.63
4	The content provides the opportunity to solve problems that appear in mathematics.	11	10.78
5	Formulate issues that spark discus7sion in the classroom.	11	10.78
6	The content provides the opportunity to justify mathematical concepts in writing	7	6.86
Total frequencies and percentages for the first criterion		**102**	**26.91**
Second: the criterion of mathematical correlation in statistics and probabilities			
7	The content provides the opportunity to link conceptual knowledge with procedural knowledge.	28	25.69
8	It uses content and employs technology in learning and teaching mathematics	2	1.83
9	Provides an opportunity to build relationships and connections on students' previous experiences.	14	12.84
10	Works to link statistics and probability with useful applications in practical life.	28	25.69
11	Content provides the opportunity to link relationships with each other	10	9.17
12	It helps students to identify the relationships between mathematical ideas and their use.	10	9.17
13	It gives students the opportunity to see the relationship between mathematics and other sciences	17	15.6
Total frequencies and percentages for the second criterion		**109**	**28.76**
Third: the mathematical communication standard in statistics and probabilities			
14	Explains his thinking while facing mathematical situations and problems	32	53.33
15	It helps the student to develop his initial understanding of mathematical concepts.	4	6.67
16	He uses the skills of reading, listening, watching	24	40

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	and discussing to evaluate and interpret the ideas of mathematics.		
17	Appreciates the value of mathematicians and their role in developing the ideas of mathematics	0	0
Total frequencies and percentages for the third criterion		**60**	**15.83**
Fourth: the standard of mathematical representations in statistics and probabilities			
18	The content provides the student with visual presentations or illustrations that explain the relationships	5	5.81
19	Provides graphs or diagrams that facilitate the learning of statistics and probability.	2	2.33
20	The content provides the opportunity to justify using mathematical models	6	6.98
21	It displays representations in the form of tables that contribute to the interpretation of relationships.	8	9.30
22	It displays mathematical representations that directly affect the student's experience.	7	8.14
23	Provides representations that make statistical ideas tangible.	6	6.98
24	The content provides students with appropriate symbols to express ideas	12	13.95
25	Technology is used to expand students' representations.	0	0
26	Provides abstract mathematical representations using equations to analyze relationships.	2	2.33
27	It integrates situations using oral, written, pictorial and graphic methods.	38	44.19
Total frequencies and percentages of the fourth standard		**86**	**22.69**
Fifth: Standards of inference and proof in statistics and probabilities			
28	Knowledge of the logical foundations of mathematical proof and the different methods of proof.	0	0
29	Familiarity with the logical foundations of mathematical proof	0	0
30	Uses definitions and logical laws to prove the validity of a mathematical relationship.	2	9.09
31	Find logical fallacies and correct them.	3	13.64
32	Build mathematical guesses and test them	5	22.73
33	The content provides the opportunity for justification through graphics and figures.	5	22.73
34	The content discusses the ideas of mathematics and is based on conjectures and convincing arguments.	7	31.82

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Total frequencies and percentages for the fifth criterion	**22**	**5.8**
Total	**379**	**100**

The results of table above show that the main criterion of mathematical correlation in statistics and probability obtained the highest frequency within the main standards of statistics and probability in mathematics books for the seventh grade, with a frequency of (109), With a percentage of (26.91) of the total number of repetitions. The main criterion of inference and proof in statistics and probabilities ranked last among the main standards of statistics and probabilities in mathematics books for the seventh grade, as it reached (22) repetitions, with a percentage of (5.80) of the total score.

In light of the high frequency of the mathematical correlation standard in the content of statistics and probability in the seventh grade textbook, the researcher believes this reflects the designer's intent to highlight connections between conceptual and procedural knowledge, thereby facilitating students' transition from theoretical understanding to practical application, and indicates an effort to relate content to students' daily lives to enhance its relevance, while the researcher also notes that the inference and proof standard's last-place ranking reveals a lack of focus on developing learners' critical thinking and logical verification skills, suggesting that future curricula should strengthen this aspect to foster students' mathematical reasoning skills.

The results related to the indications of the solution to the solution of the issue, the indicator came, "The content provides a serious knowledge of a new knowledge of statistics and possibilities through the solution to the issue" on the first of the most frequently repeated (29) with a percentage of (28.43). The last indicator, which states "the content provides an opportunity to justify mathematical concepts in writing," had a frequency of (7), with a percentage of (6.86).

Regarding the problem-solving standard, the researcher interprets the prominence of the indicator "providing opportunities to build new knowledge through problem solving" as evidence that activities are designed to enable students to inductively acquire statistical concepts, reflecting an active learning approach, whereas the low frequency of "providing opportunities to justify concepts in writing" appears to stem from the textbook's emphasis on presenting and solving problems over developing students' written expression and interpretation skills, indicating a need for more written justification tasks in future editions.

The results related to the mathematical correlation criterion, the indicators that state "the content provides an opportunity to link conceptual knowledge with procedural knowledge" and "works to link statistics and probability with useful applications in practical life" with a frequency of (28) and a percentage of (25.69). While the indicator "uses content and employs technology in learning and teaching mathematics" ranked last, with a frequency of (2) and a percentage of (1.83).

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Concerning the mathematical correlation criterion, the researcher sees the high frequencies of "linking conceptual knowledge with procedural knowledge" and "connecting content to useful real-life applications" as reflecting the textbook designers' awareness of the importance of practical relevance in motivating learners, while the minimal occurrence of "using technology in learning and teaching mathematics" is attributed to limited classroom technology resources and insufficient teacher training and infrastructure support, which hinders the integration of this increasingly vital element in modern education.

The results related to the mathematical communication criterion, the indicator that states "clarifies his thinking while confronting mathematical situations and issues" ranked first. with a frequency of (32), with a percentage of (53.33), while the indicator "estimates the value of mathematicians and their role in developing the ideas of mathematics" came in the last place, with a frequency of (0) and with a percentage of (00.0).

With respect to the mathematical communication standard, the researcher feels that the strong presence of "explaining one's thinking when facing mathematical situations" indicates the inclusion of open-ended questions that encourage verbal expression and discussion of students' thought processes, thereby enhancing communication skills, whereas the absence of "appreciating the value of mathematicians and their contributions" reflects a lack of attention to historical context and scientific personalities in mathematics, depriving learners of human connections to the subject.

Moreover, the results related to the criterion of mathematical representations, the indicator that states "incorporates situations using oral, written, pictorial and graphic methods" came in the first place. With a frequency of (38), with a percentage of (44.19), while the indicator "Using technology to expand students' representations" came in the last place, with a frequency of (0) and with a percentage of (0.0).

As for the mathematical representations standard, the researcher notes that the emphasis on "integrating situations through oral, written, pictorial, and graphic methods" stems from the designer's desire to diversify presentation styles to accommodate various learning preferences, while the complete absence of "using technology to expand students' representations" points to weak technical support in primary schools and a curriculum design that avoids digital media, highlighting the necessity of providing educational tools and software in future textbook editions.

In addition, the results related to the criterion of inference and proof, the indicator that states "content discusses mathematical ideas and is based on convincing conjectures and arguments" came in the first place. with a frequency of (7), with a percentage of (31.82). Whereas the indicator "knowledge of the logical foundations of mathematical proof and the various methods of proof" and "knowledge of the logical foundations of mathematical proof" came in the last place with a frequency of (0) and a percentage of (00.0).

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Finally, regarding the inference and proof standard, the researcher believes that the prominence of "discussing mathematical ideas based on conjectures and convincing arguments" demonstrates an effort to engage students in simple dialogues requiring informal justification, whereas the absence of "knowledge of the logical foundations and methods of proof" reflects insufficient inclusion of content necessary for building rigorous logical proof concepts, underscoring the need for subsequent studies and curricular revisions to enhance students' inferential mathematical thinking.

The high frequency of the mathematical-connection standard in the current study mirrors Al-Badri's (2022) finding that middle-school algebra texts strongly link conceptual and procedural knowledge, and aligns with Alabdulaziz's (2021) observation of robust connections between mathematical ideas and real-life applications; it also corresponds with Al-Hasban's (2018) report of substantial intra-algebra coherence in Jordanian textbooks. Conversely, the scant use of technology in mathematical representations echoes Elsayed's (2021) identification of very few technology-related indicators in Omani textbooks, and supports Haji's (2019) note on the limited exploitation of digital tools in teaching. The almost complete absence of the inference-and-proof standard is fully consistent with Abdel-Aal's (2018) finding of weak coverage of proof foundations in Jordan's seventh-grade book and with Huey and Weber's (2018) conclusion that secondary teachers lack readiness to teach statistical inference. Likewise, the strong presence of problem-solving activities that build new knowledge parallels Abdel-Aal's (2018) ranking of "using problem-solving methods to understand content" as the most frequent sub-criterion, and reflects Haji's (2019) emphasis on verbal and written expression to deepen understanding, while the low frequency of written justification agrees with Haji's observation of few opportunities for students to justify concepts in writing. Finally, the prominence of mathematical communication through "explaining one's thinking" aligns with Haji's (2019) stress on oral and written discourse, whereas the complete lack of indicators for "appreciating mathematicians' contributions" reveals a gap not addressed by these prior studies, pointing to a fruitful avenue for future research.

Results

The study reached the following results:

- The results show that the main criterion of mathematical correlation in statistics and probability obtained the highest frequency within the main standards of statistics and probability in mathematics books for the seventh grade, and the main criterion of inference and proof in statistics and probabilities ranked last among the main standards of statistics and probabilities in mathematics books for the seventh grade.

- Results related to problem solving issues indicated that the content provides serious knowledge of statistics and probability through problem solving.

- As for the results related to the mathematical correlation criterion, they indicated that the content provides an opportunity to link conceptual knowledge with procedural

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knowledge and works to link statistics and probability with useful applications in practical life.

- As for the results related to the sports communication standard, the results indicated that clarifying the student's ideas while confronting sports situations and issues increases the level of sports communication.

- The results related to the mathematical representation criterion indicated that integrating situations using oral, written, pictorial, and visual methods, and using technology to expand the representation of students in last place have a clear role in mathematical representation.

- As for the results related to the standard of reasoning and proof, they indicated that the content discusses mathematical ideas and relies on guesses and convincing arguments.

Recommendations

1. There should be an enhancement of standards for reasoning and proof in the seventh-grade curriculum, this can be achieved by providing more opportunities for critical thinking, building arguments.

2. There is a need to develop standards for mathematical representation in the curriculum to include the use of information and communication technology (ICT) to expand students' representation capabilities and the use of multiple modes such as oral, written, pictorial, and visual.

3. Standards for mathematical communication can be enhanced by providing opportunities to clarify students' ideas and enhance their interaction with a variety of sports situations and issues.

4. The balance of content in statistics and probability in the curriculum should be improved to provide a deep and comprehensive understanding of the subject through problem-solving and linking conceptual knowledge with procedural knowledge.

5. Integrate practical applications of statistics and probability in the curriculum to connect concepts with real-life applications and enhance a deep understanding of the subject.

Open research question:

How does the integration of technology-enhanced inferential units influence the development of basic-stage students' skills in proving statistical relationships in Palestine?

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