Availability of the Common Core State Standard for Mathematics (CCSSM) in Mathematics Textbook of the 5th Bio-Scientific Grade

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Article History: Received: 10 November 2020; Revised 12 January 2021 Accepted: 27 January 2021; Published online: 5 April 2021

Abstract: The aim of the research is to: Analyzing the content of the mathematics textbook of the 5th bio-scientific grade according to the Common Core State Standard for mathematics (CCSSM), and to identify the extent of their inclusion of these standards.

To achieve this goal, the researcher built the CCSSM after reviewing the literature that dealt with those standards, and its validity was verified by presenting it to a group of referees specialized in the field of methods of teaching mathematics. Thus, the criteria in their final form consisted of six main criteria which are:(numbers and quantities, algebra, conjugations, modeling, geometry, statistics and probability) and included (47) sub-indicators, Then the researcher analyzed the content of the mathematics textbook for the 5thbio-scientific grade, scheduled for the academic year (2020-2021) 9th edition of 2019 .in light of these criteria, as they appeared in 217 analyzed pages ,the explicit and implicit idea was adopted for recording and repetition units for the census.

The Holsti equation was used to calculate the stability factor of the analysis in agreement with external analysts and the researcher himself over time, and the results of the research: -

The weakness of the Common Core State Standards for Mathematics (CCSSM) of the mathematics textbook for the 5th bio-scientific grade, in that it contains.

Key words: Mathematics, Holsti equation, stability factor, external analysis, CCSSM.

1.Introduction:

The developments that occur in the educational field necessitate the necessity of continuously following up and reviewing the content of the school curriculum through analysis or evaluation in accordance with international standards that have been termed by specialists in the teaching of each of them. They also constitute the general directions that govern the processes of teaching this topic to make it meet the requirements of the educational path in the future. Our students have achieved the basic factors necessary to form a successful thought to keep pace with the requirements of the times.

This was reinforced by what was indicated by the Third International Conference of the College of Education Ibn Rushd held in Baghdad 24-25 / 4/2016 entitled (Introductions and Results for Education Reform in Iraq / College of Education as a Model) under the slogan (Educational Reform, an Educational Vision in Iraqi Education) to the necessity Reconsidering the school curriculum and enriching it with thinking abilities and skills (Republic of Iraq / Ministry of Education, 2016).

1.1. Problem of Research

through the researcher's review of previous studies, including the study (Al-Aboudi, 2012), which

aimed to (build standards for developing mathematics curricula in light of international standards and the extent of their inclusion in mathematics curricula for the elementary stage), it was concluded that the vocabulary of mathematics books for the elementary stage is not completely compatible with the standards As well as the study (Kazem, 2015), which aimed to (evaluate the content of mathematics textbooks for the middle stage in light of international quality standards), which confirmed that the percentage of availability of international standards for mathematics books for the middle stage was roughly ranging between (30% -38%), which is a small percentage From the above, the research problem is determined by the following question:

What is the percentage of availability of the Common Core Standards for Mathematics (CCSSM) included in Mathematics textbook for the 5th bio-scientific Grade?

1.2. Research Importance

Theoretical importance:

1 -The research starts from the latest global trends in building standards, which may contribute to building a curriculum document due to its lack of availability in Iraq.

2 -Synchronizing the research with Iraq's aspirations in building curricular standards, which would contribute to conducting studies in light of other criteria.

3 -The research offers proposals that may contribute to developing mathematics textbooks and providing curriculum decision-makers and those in charge of building curricula with them.

Applied importance:

1 -The research uses criteria that contribute to building a mechanism for analyzing the content of mathematics textbooks for the benefit of designers and planners of educational programs and researchers in this field.

2- The research sheds light on the gaps in the science book of mathematics for the fifth grade, the science section, the biological branch, which helps the developers of mathematics curricula to evaluate them.

1.3. Research Goals

The current research aims to:

Knowing the percentage of availability of the CCSSM Included in the Mathematics textbook for the 5th bio-science grade, in Iraq for the academic year (2020-2021), the 9th Edition of 2019.

1.4.Search Limits

The current research is limited to:

1. Mathematics textbook for the fifth bio- science grade in Iraq for the academic year (2020-2021), 9thedition of 2019.
2. the Common Core State Standard for mathematics (CCSSM).

1.5. Define terms

1.5.1. standards

- Defined linguistically by (Bin Manzour, 2003) that it is a plural word and its singular is a criterion, which is what others measure with it or it is the verified model of what the thing that you do should be. (Bin Manzur, 2003, 254)

- Defined Idiomatically by (Al-Laqani and Al-Jamal, 2003) is a convention, the results of many scientific and educational opinions Where through its application it is possible to know the true picture of the subject to be evaluated or to reach judgments about the thing that you do. (Al-Laqani and Al-Jamal, 2003, 279)

1.5.2. Educational standards
Defined by- :
•(Al-Khazindar, 2006) as guidelines or guidelines for setting a standard for the quality of educational content and for obtaining high-quality expectations for educational outcomes through that content by setting cognitive goals that can reach the student in certain stages and lead to quality in education and be the basis for building the curriculum.
(Khaznadar, 2006, 358).
• (Mahmoud, 2008) as expressions that refer to the minimum competencies required to be achieved for a specific goal and determine the desired learning and learning outcomes for school work, represented by the performance that the teacher should do and the knowledge, skills, values and trends he attains at the end of the school stage. (Mahmoud, 2008, 1458)
1.5.3. the Common Core State Standard for mathematics (CCSSM)
- Defined as a document issued in 2010 in cooperation with a number of institutions specialized in teaching and learning mathematics in the United States, known as CCSSM. (Heidi Ann Ertl, 2014).
- Defined (Akkus, 2016) as standards designed to ensure that all students will graduate from school with sufficient skills, possess the necessary knowledge and are able to employ it in school, work and life.

(Akkus ,2016,50).
2.Theoretical background
2.1. The Common Core State Standard for mathematics (CCSSM)

The Common Core American Standards for Mathematics are based on previous efforts to NCTM standards, strings of mathematical prowess approved by the National Research Council [NRC], and reports of the Mathematics Learning Study Commission, in addition to both the standards of leading countries in education, and the standards of different states. , Research results, scientific committees, college standards, development requirements, and results of the third international study of trends in mathematics and science education (TIMSS) in its years: 1995, 1999, 2003, 2007 are anchors to the CCSSM. (Dossey, et al,2016,P16)

2.1.1. Advantages of the CCSSM:
1 -Focusing by narrowing the scope of mathematics content, and focusing time in school classes on the main work of each class, instead of the race to cover a number of topics, which end with books that are more intense and deeper.
2 -Cohesion, which is achieved through the accurate and careful linking of knowledge learning across classes, and across fields of knowledge, as mathematics is not based on separate topics, or topics based on memorization, but rather is an interconnected group of knowledge, designed to reflect a coherent structure, and any gap in this cohesion affects all Later learning of the student.
3 -Rigor through accuracy in achieving depth, not introducing concepts that are not appropriate for the age group, and working to help students meet three important aspects and balance them, namely:
conceptual comprehension, procedural skills and fluency, application. (CCSSI,2010)

2.1.2. Justification for the use of the CCSSM
Hughes et al. (2014) mentioned justifications for the use of the CCSSM in schools, namely:
- The CCSSM provides a framework for developing higher-level skills than was the case with previous standards.
- The CCSSM focuses on the use of open-end and higher-level teaching methods.

• The CCSSM requires students to produce evidence of learning through products that emphasize the use of higher-level skills. (Hughes et al,2014)

2.2. Previous studies
The researcher has reviewed a number of previous studies related to the topic of his research. As he was able to obtain (4) Arab studies, and (2) foreign studies, and he was not able to obtain a local study, and

the studies varied between the degree of availability of the (CCSSM) the Common Core State Standard for mathematics, and the following is a presentation of these studies as shown in the table of previous studies according to the sequence Chronological:

1) (Rimbey,2013) Study, the relationship between professional development of teachers based on the Common Core State Standards for CCSSM and their practice in the classroom and student education

2) (Bradby,2014) study measuring the level of concentration and coherence of the content of school mathematics textbooks from the fourth to the eighth grade

3) (Al-Kurdi Study,2016) study, analyzing the content of statistics and probabilities in middle school textbooks in Saudi Arabia in light of the Common Core Standards for Mathematics CCSSM

4) (Al-Suraei ,2017) study ,the effectiveness of a proposed training program in developing the algebraic mathematical skills of high school students in light of the Common Core Standards for Mathematics in the United States of America (CCSSM)

5) (Al-Ghamdi and Al-Tamimi, 2018) study to evaluate the content of mathematics textbooks for lower grades 1-3 in the Kingdom of Saudi Arabia in light of the content standards of the Common Core State Standard for mathematics (CCSSM)

6) (Zyadah,2019) study, the effectiveness of a science, technology and engineering stem-based program built according to the CCSSM in developing critical thinking skills in mathematics among eleventh grade students in Gaza.

2.2.1. Commenting on previous studies

1 -Goals:

The study of Al-Kurdi (2016) aimed to analyze the content of statistics and probabilities in middle school textbooks in Saudi Arabia in light of the Common Core Standards for Mathematics (CCSSM).

Both the study of Al-Ghamdi and Al-Tamimi (2018) and the study of Bradby (2014) were aimed at and these studies are similar in terms of analyzing and evaluating the content.

The Rimbey study (2013, Rimbey) explores the relationship between professional development of teachers based on the Common Core State Standard for mathematics for CCSSM and their practice in the classroom and student education.

The study (Zyadah, 2019) and Al-Suraei study (2017) are similar in building an educational program according to CCSSM standards.

2 -The sample: The previous studies differed in terms of the sample for each of them:

The study of Rimbey (2013) was applied to 38 teachers.

Study of Kurdi (2016), mathematics books for the first intermediate and second intermediate grades in the Kingdom of Saudi Arabia .

Study of Al-Ghamdi and Al-Tamimi (2018), mathematics textbooks prescribed for the lower grades of elementary school in the Kingdom of Saudi Arabia.

The study of Bradby (2014) mathematics textbooks from fourth to eighth grade.

A study (Zyadah, 2019) of 86 female students of the eleventh grade of science

And the study of Al-Suraei (2017) is 25 female students of the second grade of scientific secondary school

3 -A tool: where previous studies used tools such as the test (increase, 2019) and the rapid study (2017), while the Rimbey study (2013, Rimbey) used the observation and interview tool, and the study of Al-Ghamdi and Al-Tamimi (2018) and the Bradby study (2014, Bradby) are similar And the study Al-Kurdi (2016) in the use of a content analysis tool.

4 -Research methodology: Some of the previous studies used the experimental method, some of them the descriptive method, and some of them the semi-experimental method, such as the rapid study(2017)

5 -Statistical methods: Previous studies used similar statistical methods, such as the T-test, Pearson equation, Alpha-Cronbach equation, and the T-test for two independent samples.

6 -Results: The results of the studies have all agreed on the positive effect of the CCSSM on the focus and deep understanding of teachers and students when applying those standards, while achieving the desired goals pursued by each study with regard to the mathematics curriculum, and employing the results followed in analyzing the curriculum. According to the standards for the development of the educational learning process.

2.2.2. Beneficial aspects of previous studies

The researcher has reported that he has been acquainted with previous studies similar or close to the

topic of his research in the following:
1 .Knowing, organizing, and how to build a research tool.
2 .Knowing the most important statistical methods used in processing the results in order to reach the achievement of the objectives of this research in the appropriate and correct manner
3 .Determine some of the paragraphs and areas included in the search tool
4 .Learn how to conduct the analysis process and reach appropriate results and their interpretation
5 .Knowing the types of samples and their sizes
6. Identify the methods of obtaining the necessary validity and reliability of the study tool.

3.Research procedures

In this chapter, the researcher deals with a description of the research procedures in relation to analyzing the content of the CCSSM content included in mathematics textbook for the fifth grade and what includes determining the research methodology, data sources, as well as the research tool used and the process of preparing them, and to ensure their validity and reliability.

3.1. Choose the research method

The research methodology is the method used by the researcher in answering the questions, and it is a plan that shows and defines the methods and procedures for collecting and analyzing data. (Al-Najjar et al. 2009: p.18)

The researcher adopted the descriptive and analytical method in order to analyze mathematics textbook for the fifth scientific grade, because of the importance of this method, which is reflected in the detection of the extent to which these materials contain and include the phenomenon to be studied.

3.2. Determining the research community

The stage of determining the research community is one of the most important methodological steps in scientific research. It requires the researcher to be meticulous and to take great care of defining the original community because it depends on the conduct of the research, its design, and the efficiency of its results. (Shafiq, 2005: p. 165)

The community of this research consists of the content of the mathematics textbook fifth bio-scientific grade, for the academic year (2020-2021)

3.3. Research sample

It is a part of the community that is chosen according to practical rules and methods so that it represents the community properly. (Abboud 2014: 263)

The sample population consists of the content of the mathematics textbook, fifth bio-scientific grade, for the academic year (2020-2021) after excluding the introduction, chapters interfaces, and indexes

Table(1)
Mathematics book for the fifth bio-scientific grade

	Chapter	**The number of chapter pages**	**The ratio of the number of chapter pages of the book**
First	Logarithms	13	6%
Second	Sequences	19	9%
Third a	Conic sections	18	8%
Fourth	Circular Functions	35	16%
Fifth	Limits and continuity	19	9%
Sixth	Derivatives	39	18%
Seventh	Aerospace engineering	21	10%
Eighth	The principle of counting and permutations	20	9%
Ninth	Matrixes	33	15%
		217	100%

3.4. Search tool

The search tool is the means by which the researcher collects his data, as the researcher must choose the appropriate tool to collect his data. (Badr, 1996: pp. 36-37)

In order to achieve the research objectives, it is necessary to build a course content analysis tool to find out the availability of the Common Core State Standard for mathematics CCSSM in the fifth-grade mathematics textbook.

The researcher has prepared a list of the Common Core Standards for Mathematics (CCSSM) that should be provided in the fifth-grade mathematics textbook, and its preparation passed through the following stages:

•Access to some books and literature that dealt with the topic of the CCSSM.

•Reviewing some studies that dealt with the CCSSM.

Preparing a list of the Common Core State Standard for mathematics CCSSM included in each field as the list contained (6) domains and (47) sub-indicators

1 -Numbers and quantities, including (10) indicators

2 -Algebra and includes (8) indicators

3 -Connections and includes (8) indicators

4 -Modeling and includes (4) indicators

5 -Engineering and includes (9) indicators

6- Statistics and probabilities, including (8) indicators.

3.5. validate the analysis tool

The validity of an instrument means the ability of the instrument to measure what it was set to measure (Saber and Mervat, 2002: pg. 167).The validity of the tool was assessed by relying on the opinions of a number of experts and referees from mathematics professors, curricula and teaching methods. The researcher determines the following:

1 -The aim of the analysis in this research is to determine the percentage of availability of CCSSM in the subjects of the fifth bio- scientific grade mathematics textbook, for the academic year 2020-2021, the ninth edition of 2019.

2- The analysis sample represented by the content of the mathematics textbook for the fifth bio-scientific grade, for the academic year 2020-2021, the 9^{th} edition of 2019.

3.6. units of analysis

The researcher relied on the explicit and implicit idea as a unit of analysis for its relevance to the nature of the content and the paragraphs of the list, and repetition as a unit of the census.

3.7. Steps of content analysis

The researcher followed the following steps in the analysis process:

- Read the content of the mathematics book for the fifth bio- scientific grade a full reading to get acquainted with the basic ideas in the subject.
- Read the list of standards carefully and carefully.
- Find the availability of the CCSSM on every page.
- Dumping the results of the analysis into the previously prepared analysis form for statistical treatment.

3.8. Validity of the analysis

To ensure the validity of the analysis, the researcher presented a sample of the material analyzed for the content of the mathematics textbook for the fifth bio-scientific grade to two experts in methods of teaching mathematics and they unanimously agreed on the validity of the analysis, which was presented by the researcher as true to the analysis he had made.

3.9. Stability analysis

Stability means consistency in the results of the measurement on the same instrument or test. (Abu Nahia, 1994: p. 351), and in order for the analysis to be objective while obtaining an acceptable consistency, the researcher used two types of reliability, namely- :

1 -Stability over time: the researcher re-analyzed 30 days after the first analysis, as the stability factor

was 0.98.
2 -Stability between two different analysts: The researcher used external analysts with experience in analyzing the content, and this was done by selecting a random sample from the total analyzed content of (217) pages, as the percentage of the stability sample represented (20%) approximately (43) pages The first three chapters of the fifth-grade mathematics textbook were chosen (the biological branch), and the researcher used the (Holste) equation to find the value of the stability coefficients where the coefficient of stability between the researcher and the first analyst was 0.84 and the researcher and the analyst and the second 0,77 and between the first and second analyst 0.94.
The researcher considers the stability coefficients obtained by him acceptable, as the stability factor is good if its amount is (70%) or more. (Al-Dulaimi, 2015: 120)

4.View and discuss results
4.1.Results of research :
The percentage of availability of the common core standards for mathematics CCSSM included in the mathematics textbook for the 5th bio-scientific grade,? To answer this question, the researcher analyzed the mathematics textbook for the fifth bio-scientific grade and reached its percentage through the following results:
Table(2)
Frequencies and percentages of the CCSSM domains included in the fifth bio-scientific grade mathematics textbook

No.	the field	Repetition	percentage
1.	Numbers and quantities	96	13.33%
2.	Algebra	151	20.97%
3.	Conjugations	261	36.25%
4.	Modeling	It has been linked to other criteria	
5.	Geometry	127	17.63%
6.	Statistics and Probabilities	85	11.80%
total		720	100%

It is evident from the foregoing that there is a large discrepancy in the percentages of the CCSSM domains for the content of the fifth grade mathematics textbook as it appears that the field of conjugations achieved the highest percentage of (36.25%), followed by the field of algebra by (20.97%), then the field Engineering by (17.63%), then the field of numbers and quantities by (13.33%), then the field of statistics and probabilities by (11.80%). It is noticed that the book has paid attention to the field of associations by including topics, applications and exercises that encourage the development of skills in this area, while The field of statistics and probability was scarce in the content of the analyzed mathematics textbook.

4.2. Conclusions
The researcher, through the results of the research, reached the following conclusions- :
•The mathematics textbook for the fifth bio-scientific grade was of a low level in that it contained the CCSSM.
•The standard of associations obtained the highest percentage of achieved indicators, followed by the criterion of algebra, followed by the criterion of engineering, while the standard of numbers, quantities, statistics and probabilities obtained low percentages for the verified items.
• The topics whose objectives and vocabulary were identified by the Ministry of Education reveals that the objectives of these subjects need to be reviewed because they lack consideration of an important dimension of the objectives, namely, statistics and probability.

4.3. Recommendations
Based on the results of the current research, the researcher recommends the following- :

1 -The necessity of emphasizing the development of the content of the mathematics textbook for the fifth bio-scientific grade, and its inclusion of the CCSSM.
2 -To benefit from the CCSSM prepared in this research to analyze mathematics textbooks for the rest of the stages.
3 -The inclusion of mathematics books for the different secondary school stages of the Common Core State Standard for mathematics CCSSM.
4- Holding courses for mathematics teachers and including training programs on the Common Core State Standard for mathematics CCSSM and how to employ them for students, in cooperation with the Ministry of Education.

4.4.Propositions

As a continuation of the current research, the researcher suggests some future studies- :
1 -Conducting more similar studies at different educational stages (elementary, intermediate, and intermediate stages).
2 -Conducting a study to reveal the extent of mathematics teachers' understanding of the CCSSM.
5 -Conducting a comparative analytical study between mathematics books for the middle stage and its counterpart in the middle stage in light of the Common Core State Standard for mathematics CCSSM.
6- Conducting a comparative analytical study between students of the fifth bio-scientific grade, the morning studies , and students of the fifth bio-scientific grade, the evening studies in the range of the Common Core State Standard for mathematics CCSSM.

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