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Inclusion of 21st Century Skills in Mathematics Textbook for the sixth grade in Jordan

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Abstract

The aim of current study is to investigate the degree of inclusion of 21st-century skills in mathematics for the sixth grade in Jordan. To achieve this goal, the researcher used the descriptive-analytical method by analyzing the mathematics content for the sixth grade in Jordan based on an analysis card according to 21st century skills. The study results showed that the degree of the inclusion of 21st-century skills was very low in general. It has reached only 28.55%, and the results found a discrepancy in the degree of inclusion of main skills. The skill of critical thinking and problem solving was highly embedded. The degree of inclusion in creativity and innovation skill was medium, and the skill of informational, communications, and media literacy came in with a low percentage, The rest of the skills, including collaboration and teamwork skill, skill of computer and technology literacy, skill of career and self-directed learner and cross-culture skill) score very low.

Keywords: 21st Century skills, Analyzing the content, Mathematics textbook.

Introduction

The twenty-first century is characterized by continuous development and performance improvement in various fields, and this poses a challenge to our various educational institutions. The goal of educational institutions is no longer only to provide theoretical knowledge and its practical applications, but to prepare generations capable of facing increasing future challenges and adapting to the variables of the massive information revolution. This is in addition to its role in teaching thinking skills, problem-solving strategies, and developing decision-making skills. The school curriculum is an essential and important element in providing students with the necessary skills to keep pace with the twenty-first century.

The twenty-first century witnessed a wide interest in the skills necessary for life and work, which calls for more organized and focused efforts from educational institutions to reconsider their educational systems, curricula and methods of teaching, to meet the requirements and challenges of the twenty-first century and to provide learners with the skills necessary to keep pace with those challenges and adapt to the successive changes It enables them to work successfully to build their community and compete globally.

The trend of twenty-first century skills is one of the trends that began to gain attention among educational circles, as Shalaby (2014, 3) refers to many organizations and bodies that sought to identify these skills, such as the Organization for Economic Cooperation and Development-OECD and the Educational Laboratory of the Northern Region The North Central Regional Laboratory-NCREL as well as the Partnership for 21st Century Skills.

Based on the importance of developing twenty-first century skills, many local, Arab and international studies have focused on examining the extent to which the curricula include twenty-first century skills, such as the Shalaby study (2014), the Al-Ghamdi study (2015) and the Sobhi study (2017), and the Laar, Deursen study

Dijk&Haan.2017, Hajja study (2018), Eid study (2019), and Omari study (2020)

All this prompted the countries of the world to pay attention to the curricula system and develop it to achieve lifelong learning, and among those countries is Jordan, which launched in (2019) a project to integrate twenty-first century skills into curricula and textbooks.

Based on the foregoing and in response to the directives of the Ministry of Education to develop the educational environment to keep pace with the skills of the twenty-first century, this research came to study the extent to which twenty-first century skills are included in the mathematics textbook for the sixth grade in Jordan.

The study Problem:

Despite the educational development efforts in Jordan, which aim to improve educational outcomes and raise the level of their quality, there is no harmony between the educational outcomes and what the educational development efforts and the Ministry of Education seek. It is represented in the low educational attainment of students (Al-Khatib, 2010). The results of the international tests (2011, 2015 2003, 2007 Trends in International Mathematics and Science Study, TIMSS) are evidenced by the results of this study.

She indicated that Jordan scored a low level among the participating countries in mathematics, and the analysis of the results of the International Student Assessment Program (PISA, 2015, 2018) indicated that the average performance of Jordanian students in the field of mathematics is lower than the international average.

Where international reports indicated that this shortcoming is due to many reasons, the most important of which is the shortcomings of the curricula, where the current curricula focus on the cognitive aspects and do not rise to the higher levels of thinking whose questions focus on the level of inference and application by (65%), which requires the learner to possess the skills of the twenty-first century (Al-Awadi et al., 2011).

Experts and specialists confirm that there is a gap between the skills that students learn and what they need for life and work, as our current curricula are no longer sufficient to prepare students for life and work, and that students face difficulties in keeping pace with the skills of the twenty-first century and that they perform jobs that are likely to disappear in this century (Abu Al-Hamael, 2013). Shalaby, 2014, Rashid, 2017).

Given the importance of the basic stage in the student's life, as it is the stage on which the subsequent stages of education are built, it is considered a strong basis for building the student's personality and preparing him to play an active and positive role in his community by providing him with twenty-first century skills. Due to the scarcity of studies that dealt with the extent to which the skills of the twenty-first century are included in the mathematics textbook for the sixth grade in Jordan - within the limits of the researcher's knowledge - this study came to answer the following main question:

To what extent are twenty-first century skills included in the mathematics textbook for the sixth grade in Jordan?

The following sub-questions are derived from the main question?

1-What are the skills of the twenty-first century that must be provided in the mathematics textbook for the sixth grade in Jordan?

. 2- To what extent are the skills of the twenty-first century included in the mathematics textbook for the sixth grade in Jordan?

Objectives of the study:

1- Determining the twenty-first century skills that should be included in the mathematics textbook for the sixth grade in Jordan.

2- To identify the extent to which the twenty-first century skills are included in the mathematics textbook for the sixth grade in Jordan.

1- This study comes in response to global trends that call for the importance of including the skills of the twenty-first century in curricula in general and mathematics curricula in particular.

2- It may benefit curriculum planners and developers in terms of providing them with the

twenty first century skills that must be included in mathematics curricula for the sixth grade.

3- It may present a modest literature that paves the way for future studies on the inclusion of twenty-first century skills in school curricula.

The limits of the study:

1- The study was limited to a mathematics textbook for the sixth grade in the Hashemite Kingdom of Jordan for the academic year 2020/2021.

2- The study was limited to the twenty-first century skills that are required to be included in the mathematics textbook for the sixth grade in the Hashemite Kingdom of Jordan.

Procedural definitions:

1-Twenty-first century skills:

The Partnership Foundation defines them as Skills 21Century for Partnership as the skills that the learner needs to succeed in school, work and life, and they consist of learning and creativity skills, digital culture skills, and career and life skills" (Turling and Fadel, 2013).

The researcher defines them as the skills needed by the basic stage student in the twenty-first century to succeed in education, work and life, which must be included in the mathematics book for the sixth grade, and they are critical thinking and problem-solving skills, innovation and creativity skills, collaboration skills, teamwork and leadership, computing culture skills and technology. Information, communication, information and media culture skills, professional skills and self-reliant learning, the skill of understanding other cultures.

2- Content analysis:

Al-Laqani and Al-Jamal (2003, 145) defined it: as a method used alongside other methods to evaluate curricula in order to develop them, and depends on defining the objectives of the analysis and the unit of analysis in order to reach the extent of the prevalence of one or more phenomenon or ideas, and thus the results of this process are in addition to the results obtained. Through other methods that determine future development.

The researcher defines it as a quantitative analysis of the contents of the mathematics textbook for the sixth grade in the Hashemite Kingdom of Jordan in the light of the skills of the twenty-first century, using the analysis tool prepared for this purpose.

Theoretical framework:

Twenty-first century skills trends are among the trends that have attracted the attention of educators and curriculum experts, because they give the learner the necessary skills to interact and deal with multiple developments in various areas of life through problem-solving skills, thinking skills, innovation, adaptation skills, profession skills, digital culture skills, and others. A necessary skill for the twenty-first century.

And Scott (Scott, 2015) defines them as competencies and skills essential for success in work and life, as they include communication, cooperation, critical thinking and creativity, which will be taught in the context of the basic topics of the twenty-first century, as it was emphasized that the challenges of the twenty-first century will require A wide range of basic skills, social and cultural skills, and an understanding of the economic and political forces that affect society.

Warner and Kaur (2017) defined it as a set of skills that students need successfully in their modern lives during the information age, including critical thinking, problem solving, creative thinking, communication, collaboration, and technology literacy.

It is defined as: "a set of learning skills in the twenty-first century, which are critical thinking and problem solving, innovation and creativity, cooperation, teamwork and leadership, a culture of communication, information and media, a culture of computing and information and communication technology, a profession, self-reliant education and an understanding of multiple cultures" (Al-Zahrani, 2019).

The partnership classified skills into three groups (Turling and Fadel, 2013) (Al-Shalabi, 2014) (Al-Harbi, 2019) (Al-Zahrani, 2019):

First: Learning and creativity skills:

These are the skills that distinguish learners who are preparing for life and work in the twenty-first century from others. The skills that make up this group are responsible for developing the learner's abilities to succeed on the professional and personal levels. This group includes the following skills: critical thinking and problem solving skills, communication skills Collaboration, creativity and innovation skills.

Second: Information technology and media skills:

It includes the learners' ability to access, manage, evaluate and use information with the application of related ethical requirements, in addition to the learner's ability to analyze various media and effectively employ technological tools. This group includes the following skills: the skill of information culture, the skill of media culture, the skill of information and communication technology.

Third: Life and Profession Skills:

It means the ability of the learner to work independently, to become self-directed, the ability to be flexible and adapt to change, manage projects, take responsibility and reach results. This group consists of the following skills: flexibility and adaptation, initiative and self-direction, the skill of social interaction and multicultural interaction, the skill of productivity and accountability, leadership and responsibility.

The Twenty-first Century Partnership, as stated in (Turling and Fadel, 2013), concluded that the previous eleven skills were shortened into seven main skills, and each skill begins with the letter (C) and is symbolized by the symbol (7Cs) to be easy to remember, and by integrating it with the basic skills (reading, writing and arithmetic). Which is symbolized by the symbol (3Rs) produces the formula for successful learning in the twenty-first century: 3Rs*7Cs)) = successful learning in the twenty-first century. The following table shows the seven skills:

Table (1) The 21st Century Partnership and the Seven Skills

21st Century Partnership Skills	Seven skills	
Learning and creativity skills		
Critical thinking and problem solving	Critical thinking and problem solving	-
Communication and collaboration	Communication, information and media culture	-
creativity and innovation	Collaboration and working in the leadership team	-
IT and media skills		
Information culture skill	) included in the culture of communication, information and media(	
media culture skill	)included in the culture of communication, information and media(	
ICT skill	computing, information and communication technology	-
Life skill and profession		
Flexibility and adaptability	Occupation and self-reliant learning	-
Initiative and self-direction	(included in career and self-reliant learning)	-
The skill of social interaction and multicultural interaction	Understanding Multiple Cultures	-
Productivity and accountability skills	(included in career and self-reliant learning)	-
Leadership and Responsibility	(included in career and self-reliant learning)	-

Inclusion of twenty-first century skills in mathematics curricula:

Studies and scientific research have emphasized the need to include the skills of the twenty-first century in school curricula in general and mathematics curricula in particular, as the objectives of mathematics education have been numerous. The method of solving problems and emphasizing the importance of mathematics in our public life, and keeping pace with scientific and technological development. Accordingly,

there are several things that must be included in the mathematics curricula to develop the skills of the twenty-first century among learners, including (Shalaby, 2014), (Al-Ghamdi, 2015), (Abdul Qadir, 2018), (Al-Harbi, 2019), (Al-Zahrani, 2019). (Al-Harbi and Al-Harbi, 2021).

1- Incorporating the skills of the twenty-first century into the mathematics curricula in a systematic and intentional way.

2- Providing multiple opportunities for learners to practice and employ the skills of the twenty-first century in their daily lives by dealing with life problems.

3- Using modern teaching strategies in teaching mathematics curricula based on solving problems and projects.

4- Mathematics curricula focus on the use of modern technology in their access to and organization of mathematical knowledge.

5- Providing a variety of educational opportunities for learners to help them produce and discover mathematical knowledge.

6- Holding training courses for mathematics teachers on the importance of twenty-first century skills, and the need for diversification in teaching and assessment methods that go along with these skills.

7- Involve mathematics teachers and the community in the design to ensure their support and draw a new vision that matches the skills of the twenty-first century.

Including the skills of the twenty-first century in the mathematics curricula in a continuous integrated manner helps learners to practice critical and creative thinking, and to use mathematical knowledge to solve life problems with high efficiency, and supports the integrated growth of the learner's personality in all respects, and qualifies them for the labor market and life and keeping pace with continuous scientific and technological developments.

There are many studies that have concerned the inclusion of twenty-first century skills in curricula in general and mathematics curricula in particular.

The study of (Shalaby, 2014) aimed to develop a proposed scenario for integrating twenty-first century skills in science curricula in basic education in Egypt. Content To analyze the content of the Science Book for Basic Education, which is (6) books. The study concluded that there is a clear decline in dealing with these skills in science books, as well as a proposed framework consisting of (3) skill sets that include a number of sub-skills.

The study of (Al-Ghamdi, 2015) aimed to identify the degree of availability of twenty-first century skills in the content of the mathematics book for the upper grades of the primary stage, where the researchers used the descriptive analytical method, using the content analysis method. The study concluded that the availability of twenty-first century skills in the content of mathematics books for the upper grades of the primary stage is moderately high.

The study of Van Laar and others (Van Laar et al, 2017) also aimed to study the relationship between the skills of the twenty-first century and digital skills, and it also aimed to develop a framework of digital skills in the twenty-first century with conceptual dimensions and main operational components, directed to the knowledge factor. This study was carried out at the Dutch universities of Twente and Erasmus Rotterdam, and accordingly a systematic review of some literature in the social sciences was conducted. A compilation of academic literature relevant to digital skills in the twenty-first century. A number of criteria were set to identify the most relevant studies, and (1592) different articles were examined, of which only (75) articles met the pre-specified inclusion criteria. The results of this study show that 21st century skills are broader than digital skills. In addition, in contrast to digital skills, 21st century skills are not necessarily supported by ICTs.

(Al-Harbi, 2019) conducted a study aimed at knowing the extent to which the skills of the twenty-first century are included in the mathematics book for the third intermediate grade in Saudi Arabia. The twenty-first century, and the results of the study showed weakness in including twenty-first century skills for the three domains. As well as weakness in the main skills except for critical thinking and problem solving skills, which were included in a high percentage.

(Al-Sabiba, 2020) conducted a study aimed at identifying the extent to which the skills of the twenty-first century are included in the Arabic language textbook for the sixth grade in Jordan.

To achieve this goal, the researcher used the descriptive analytical approach, and the results of the study showed a clear decline in the inclusion of the Arabic language book for the skills of the twenty-first century.

Both (Al-Shahrani and Al-Mahfouz, 2020) conducted a study aimed at evaluating the content of science curricula at the intermediate stage in the light of the skills of the twenty-first century, and used to achieve the objectives of the study the descriptive approach, and the evaluation process was applied to a number of units in the science curricula at the intermediate stage, by choosing From each semester one of the units, and therefore the study sample consisted of (6) units included in science books for the intermediate stage, and an analysis list was prepared according to the skills of the twenty-first century as a study tool used for the purpose of analysis, and the study reached results, the most important of which are: The skills of learning and creativity are available In the science curricula of the intermediate stage with a weak degree, and that digital culture skills in the science curriculum of the first intermediate grade are not available, also in the curriculum of the third intermediate stage, while they are available in the curricula of the second intermediate grade with a weak degree, and that life and career skills are not available in the science curricula of the intermediate stage.

The study (Al-Harbi and Al-Harbi, 2021) aimed to identify the level of inclusion of twenty-first century skills in the mathematics textbook for the second intermediate grade in Saudi Arabia. The analytical descriptive approach was used, and its tool consisted of a content analysis card. The study concluded that the degree of inclusion of twenty-first century skills was medium.

Through the presentation of previous studies, it is clear that all studies focused on twenty-first century skills and the importance of including them in school curricula in general and mathematics curricula in particular. (Al-Sabiba, 2020), (Al-Shahrani and Al Mahfouz, 2020) and (Al-Harbi, 2019). The study samples varied, as they dealt with different textbooks such as science, mathematics, and the Arabic language for different academic levels.

Study population and sample

The study population included all mathematics books for the basic intermediate stage for the academic year (2020-2021), and the study sample was represented by the mathematics book for the sixth grade, in its first and second parts.

Study tool:

It was represented in Al-Ghamdi's content analysis tool (2015). In its initial form, the tool included (43) distributed over seven areas.

Validity of the tool:

To ensure the validity of the tool, it was presented to a group of arbitrators specialized in curricula and teaching methods. In its final form, the tool included (38) skills distributed over three areas, as shown in the following table:

Table (2): Distribution of content analysis tool domains.

Key skills	Number of sub-skills
Critical thinking and problem solving skill	7
Creativity and innovation skill	5
Collaboration and teamwork skill	5
Communication, information and media culture skill	4
Computing and information technology skills	6
Occupational skill and self-reliant learning	7
The ability to understand other cultures	4
Total	38

Tool stability

He used the analyst agreement method to ensure the stability of the tool, where a cooperative analyst and a specialist from the mathematics teachers analyzed the content of a random unit from the mathematics book for the sixth grade - the study sample - to compare it with what the researcher reached when analyzing the same unit of study, and by applying the stability equation of Cooper it was found that the value of The stability was (0.86) between the two analyzes, and the stability coefficient is considered stable and acceptable,

which indicates the stability of the analysis process.

Analysis controls

1- he scientific content of the book was analyzed except for the cover, introduction, and indexes

2- Unit of Analysis: The idea unit was chosen as the unit of analysis due to its relevance to the nature and objectives of the study.

3- The teacher's evidence was not included in the analysis process.

4- Judgment controls on the extent to which the skills of the twenty-first century are included in the mathematics textbook for the sixth grade, according to the following table (Al-Harbi, 2019):

Table (3) Judgment controls on the extent to which the skills of the twenty-first century are included in the mathematics textbook for the sixth grade

Percentages	Extent of embedding
%100- %90	Very large
%90-%70	Large
%70-%50	Medium
%30-%50	Low
%30-%1	Very low
Zero	Zero

Presentation and discussion of the results

To answer the first question: What are the skills of the twenty-first century that should be available in the mathematics textbook for the sixth grade in Jordan?

To answer this question, the researcher prepared a list of the twenty-first century skills that must be available in the mathematics textbook for the sixth grade in Jordan, by making use of the skills of the Partnership for Twenty-first Century Skills, because they are considered more comprehensive, detailed and clear, in addition to benefiting from educational literature and studies Previous studies such as the study of Al-Ghamdi (2015), Subhi (2016) and Sheikh Eid (2019). To transform twenty-first century skills into an analysis tool suitable for mathematics. The tool consisted of (7) main skills, and under each main skill there are several indicators, reaching (38). How much is shown in the following table:

Table (4) A list of the twenty-first century skills that are not available in the mathematics textbook for the sixth grade in Jordan

Key skills	Sub skills
Critical thinking and problem solving skill	1. The content includes different types of thinking (induction, deduction)
	2. Directs the learner's content to critical thinking about mathematical problems.
	3. The content includes analysis of alternatives and viewpoints that are embedded in mathematical knowledge.
	4. The content includes mathematical situations that require the learner to solve mathematical problems in an unfamiliar way.
	5. The content develops the skill of interpreting mathematical data and information.
	6. The content includes situations for the development of decision-making skill.
	7. The content includes opportunities to solve mathematical problems individually.
Creativity and innovation skill	1. The content encourages the generation of various alternatives and solutions to solve mathematical problems such as (brainstorming). 2. The content encourages the building and expansion of ideas. 3. The content requires unfamiliar interpretations of geometric figures and mathematical data. 4. The content motivates you to solve math problems in unfamiliar ways.

	5. The content includes situations that require defining the problem in mathematical problems and planning to solve it.
Collaboration and teamwork skill	1. The content encourages professional team leadership.
	2. The content presents sports activities that are carried out collectively.
	3. The content stimulates the use of mathematics in solving some societal problems.
	4. It directs human behavior towards integrity.
	5. The content encourages learning from and benefiting others.
Computing and information technology skills	1. The content includes sports situations that require the use of modern technologies.
	2. The content reinforces positive attitudes towards the use of technology.
	3. The content urges making judgments on the quality of information and its sources.
Communication, information and media culture skill	4. The content includes sports situations that require the use of digital technologies to access information.
	1. The content includes situations that require verbal expression of mathematical ideas.
	2. The content includes situations that require the expression of mathematical ideas in writing.
	3. Content enhances access to information with both time and resource efficiency.
	4. The content is directed to what is published in the media and to benefit from it.
	5. The content includes sports situations that require the use of multiple tools and media.
Occupational skill and self-reliant learning	6. The content urges making judgments about the effectiveness of the means and techniques.
	1. The content develops adaptability to different roles and responsibilities.
	2. The content develops the feedback investment effectively.
	3. It includes teaching situations with increasingly complex sports projects.
	4. The content clarifies the objectives for the learners.
	5. The content includes mathematical problems that motivate the learner to self-question.
	6. The content includes sports situations that develop a sense of responsibility and bear the results.
The ability to understand other cultures	7. It includes mathematical situations that require going beyond the requirements of the curriculum to the exploration and expansion of personal learning.
	1. The content encourages respect for different cultures.
	2. The content includes situations for developing interaction skills with others, such as (listening and speaking).
	3. The content emphasizes noble human values.

2- To answer the second question: To what extent are twenty-first century skills included in the content of the mathematics textbook for the sixth grade in Jordan?

To answer this question, the content of the mathematics book for the sixth grade was analyzed using the analysis card and calculating

the frequencies and percentages to achieve the indicators of each skill and the overall skills.

Table (5) results of the sixth grade math book analysis

Mathematics book for sixth grade	**total ideas**
The first semester	560
The second semester	512
The total	1072

First: the results of the analysis of critical thinking and problem solving skills

Table (6) results of analyzing the content of the mathematics book for the sixth grade in the light of including the skill of critical thinking and problem solving

P	Sub skills	First semester	Percentage	Second semester	Percentage	Total	Percentage
1	The content includes different types of thinking (induction, deduction)	99	%17.78	75	%14.65	174	%16.23
2	The content offers opportunities to judge different answers.	50	%8.93	70	%13.67	120	%11.19
3	Content includes analysis of alternatives and perspectives embedded with mathematical knowledge.	20	3.75	17	%3.32	37	%3.45
4	The content includes mathematical situations that require the learner to solve mathematical problems in an unfamiliar way	50	%8,93	43	%8,40	93	%8.68
5	The content develops the skill of interpreting mathematical data and information	100	%17.86	80	%15,63	180	%16,79
6	The content includes situations to develop the skill of decision-making	2	%0.36	1	%0,20	3	%0,28
7	The content includes opportunities to independently solve mathematical problems.	170	%30.36	150	%29,30	320	%29,85
	Total	491	%87,68	436	%85,16	927	**47,%86 Highly Included**

It is evident from Table (6) that the percentage of inclusion of critical thinking and problem solving skills in the mathematics book for the sixth grade was (86.47%) and with a high degree of inclusion, as it was available in the first semester by (87.68%) and included in the second semester by (85.16%)), while the "content includes opportunities to solve mathematical problems independently" got the highest rank with an inclusion rate (85.29%), while the "content includes situations for developing decision-making skill" index got the lowest rank with an inclusion rate (28.0%). This result may be attributed to the fact that the nature of mathematics subjects is rich in mathematical situations that require interpretation of information and data, and is considered a fertile field for training the student on patterns and

methods of sound thinking and developing it through mathematical activities and issues. Mathematical thinking, logical thinking, inductive reasoning, and deductive reasoning. This result is consistent with the study of Al-Ghamdi (2015), the study of Al-Harbi (2019) and the study of Al-Harbi and Al-Harbi (2021).

Second: The results of the analysis of creativity and innovation skill.

Table (7) results of analyzing the content of the mathematics book for the sixth grade in the light of the inclusion of creativity and innovation skill

p	Sub skills	First semester	Percentage	Second semester	Percentage	Total	Percentage
1	The content encourages the generation of various alternatives and solutions to solve mathematical problems such as (brainstorming).	92	%16,43	105	%20,51	197	%18,38
2	Content prompts the building and expansion of ideas	51	%9,11	56	%10,94	107	%9.98
3	The content requires unfamiliar interpretations of geometric figures and mathematical data	32	%5,71	23	%4,49	55	%5,13
4	The content motivates you to solve math problems in unfamiliar ways	79	%14,11	60	%11,72	139	%12,97
5	The content includes situations that require defining the problem in mathematical problems and planning to solve it.	40	%7,14	30	%5,86	70	%6,53
	Total	294	%52,20	274	%53,52	568	%52, 99 Medium included

It is clear from Table (7) that the average percentage of creativity and innovation skill was available (52.99%) with a medium degree of availability, as it was available in the first

semester at a rate of (52.50%), while it was available in the second semester with an availability rate of (53.52%). Where the index "content encourages the generation of alternatives and various solutions to solve mathematical problems such as (brainstorming)" came with the highest availability, reaching (38.18%), while the "content requires unfamiliar interpretations of geometric shapes and mathematical data" came with the lowest percentage, which reached (13, This result can be explained by the fact that mathematics is considered a mediator of creativity through its diverse and unfamiliar solutions to mathematical problems and problems, in addition to presenting open problems that allow for creativity and diversification of solution approaches.This result is consistent with the study of Al-Ghamdi (2015) and the study of Al-Harbi And Al-Harbi (2021), and it differed with Al-Harbi's study (2019) and Al-Sabiya's study (2020), and this is due to the difference in the research community and its sample.

Third: The results of the analysis of the skill of cooperation and teamwork.

Table (8) results of analyzing the content of the mathematics book for the sixth grade in the light of the inclusion of the skill of cooperation and teamwork

P	Sub skills	First semester	Percentage	Second semester	Percentage	Total	Percentage
1	Content encourages professional team leadership	0	%0	0	%0	0	%0
2	The content provides sports activities that are carried out collectively	0	%0	3	%0.59	3	%0.28
3	The content stimulates the use of mathematics to solve some societal problems	8	%1.43	2	%0.39	10	%0.93
4	It directs human behavior towards righteousness	4	0.71%	3	0.59%	7	%0.65
5	The content encourages learning from and benefiting others	0	%0	1	%0.20	1	%0.09
Total		12	%2.14	9	%1.76	21	**%1.96 Very low included**

It is clear from Table (8) that the average percentage of availability of the skill of cooperation and teamwork amounted to (1.96%) with a very low degree of availability, as it was guaranteed in the first semester by (2.14%) and guaranteed in the second semester by (1.76%), where the indicator came The content stimulates the use of mathematics in solving some societal problems "with the highest rate of inclusion, which reached (0.93%), while the index "encourages the content to lead the team professionally." The lowest inclusion rate was (0%). This result can be explained by the lack of sufficient time in the classroom to activate

collectively implemented sports activities and situations, in addition to the fact that mathematics curricula do not focus primarily on social skills compared to other curricula. This result is consistent with the study of Shalabi (2014), the study of Al-Sabiba (2020), the study of Al-Harbi and Al-Harbi (2021) and the Al-Harbi study (2019). And it differed with the result of the study and study of Al-Ghamdi (2015), where it was guaranteed a low degree.

Fourth: The results of the analysis of the skill of computing and information technology.

Table (9) results of analyzing the content of the mathematics book for the sixth grade in the light of the inclusion of the skill of computing and information technology and culture

P	Sub skills	First semester	Percentage	Second semester	Percentage	Total	percentage
1	The content includes math situations that require the use of modern technologies	2	%0.36	0	%0	2	%0.19
2	The content reinforces positive attitudes towards the use of technology	5	%0.89	0	%0	5	%0.47
3	Content urges judgments about the quality of information and its sources.	0	%0	0	%0	0	%0.00
4	The content includes mathematical situations that require the use of digital technologies to access information.	0	%0	0	%0	0	%0.00
	Total	7	%1.25	0	%0	7	**%0.65 Very low included**

It is clear from Table (9) that the average percentage of the availability of computing and information technology skill was (0.65%) with a very low degree of availability, as it was available in the first semester at a rate of (1.25%) and the skill of computing and information technology culture was not available in the second semester, where the percentage of Availability (0%) “The content reinforces positive trends towards technology use.” The highest inclusion rate was (0.47%), while the “Content urges judgments on the quality of information and its sources” indicator. And the index "content urges judgments on the quality of information and its sources." And an index, "The content includes sports situations that require the use of digital technologies to access information." The lowest inclusion rate was (0%). This may be attributed to the weak content interest in developing the skill of computing and information technology, despite its great importance to the learner, especially during the period of the Corona pandemic, and the repercussions it resulted in the transition to learning about. This result is consistent with the study of Shalabi (2014), the study of Al-Ghamdi (2015), the study of Al-Sabiba (2020), and the study of Al-Harbi and Al-Harbi (2021).

Fifth: The results of the analysis of the skill of communication, information and media culture.

Table (10) results of analyzing the content of the mathematics book for the sixth grade in the light of the inclusion of the skill of communication, information and media culture

P	Sub skills	First semester	Percentage	Second semester	Percentage	total	Percentage
1	The content includes situations that require verbal expression of mathematical ideas	5	%0.89	2	%0.39	7	%0.65
2	The content includes situations that require verbal	170	%30.35	150	%29.29	320	29.85%

	expression of mathematical ideas						
3	Content promotes access to information in both time and resource efficiency	0	%0	0	%0	0	%0
4	Directing content to what is published in the media and benefiting from it	0	%0	0	%0	0	%0
5	The content includes sports situations that require the use of various tools and media	0	%0	0	%0	0	%0
6	The content urges making judgments about the effectiveness of the means and techniques	0	%0	0	%0	0	%0
	Total	175	% 31.25	152	%29.68	327	**%30.5 Low Included**

It is clear from Table (10) that the average percentage of the availability of the communication, information and media culture skill reached (30.5%) with a low degree of availability, as it was available in the first semester by (31.25%) and it was available in the second semester at (29.68%). The content is situations that require the expression of mathematical ideas in writing. With the highest inclusion rate (29.85%), the index came "The content includes situations that require verbal expression of mathematical ideas." The inclusion rate was (0.65%). While the rest of the indicators were not available in the book, this may be due to the weak interest of the content in developing the skill of communication and information culture. This result is consistent with the study of Shalabi (2014), the study of Al-Ghamdi (2015), the study of Al-Sabiba (2020), and the study of Al-Harbi and Al-Harbi (2021).

Sixth: The results of the analysis of the skill of the profession and self-reliant learning.

Table (11) results of analyzing the content of the mathematics book for the sixth grade in the light of including the profession skill and self-reliant learning

P	Sub skills	First semester	Percentage	Second semester	Percentage	Total	Percentage
1	Develops content adapting to different roles and responsibilities	20	%3.57	25	%4.88	45	% 4,20
2	The content increases the investment of feedback effectively	23	%4.11	10	%1.95	33	%3,08
3	Includes teaching situations with increasingly complex math projects	0	%0	0	%0	0	%0
4	The content clarifies the objectives for the learners	24	%4.29	30	%5.86	54	%5,04
5	The content includes mathematical problems that motivate the learner to self-question	21	%3.75	21	%4.10	42	%3,92
6	The content includes sports situations that develop a sense of responsibility and bearing the results.	25	%4.46	14	%2.73	39	%3,64
7	It includes mathematical situations that require going beyond the	20	%3.57	14	%2.73	34	%3,17

requirements of the curriculum to the exploration and expansion of personal learning.						
Total	133	%23.75	114	%22.27	247	**%23.04 Very low included**

It is clear from Table (11) that the average percentage of the profession skill and self-reliant learning amounted to (23.04%) with a low degree of availability, as it was available in the first semester at a rate of (23.75%) and was available in the second semester at a rate of (22.27%). Content objectives for learners. With the highest inclusion rate, which amounted to (04.5%), while the "includes educational positions in increasingly complex sports projects" indicator. It was not available in the book at a rate of (0%), and this may be due to the weak interest of the content in developing the skill of the profession and self-reliant learning, and the focus of the mathematics content in the basic stage on providing students with skills, facts and basic mathematical concepts. This result is consistent with Al-Sabiba study (2020) and Al-Harbi and Al-Harbi study (2021). The result differed with the study of Al-Ghamdi (2015), where it was available in a medium degree due to the difference of the research community and its sample.

Seventh: The results of the analysis of the skill of understanding other cultures

Table (12) results of analyzing the content of the mathematics book for the sixth grade in the light of the inclusion of the skill of understanding other cultures

P	Sub skills	First semester	Percentage	Second semester	Percentage	Total	Percentage
1	The content encourages respect for different cultures	0	%0	0	%0	0	%0
2	The content includes situations to develop interaction skills with others (such as (listening and speaking(	1	%0.18	2	%0.39	3	%0,28
3	The content emphasizes different social values	4	%0.71	1	%0.20	5	%0,47
4	Content refers to what distinguishes different cultures	2	%0.36	1	%0.20	3	%0,28
	Total	7	%1.25	4	%0.78	11	**%1.03 Very low included**

It is evident from Table (12) that the average percentage of the skill of understanding other cultures came at a rate of (1.03%) with a very low degree of availability, where it was available in the first semester at a rate of (1.25%) and it was available in the second semester at a rate of (0.78%). content on different social values." With the highest inclusion rate (47.0%), while the "content encourages respect for different cultures" indicator. It was not available in the book at a rate of (0%), and this can be explained by the fact that the current mathematics curricula did not include the skills of the twenty-first century systematically and intentionally, in addition to the lack of a direct link to the skill of understanding other cultures with the mathematics curricula compared to other curricula. This result is consistent with the study of Al-Shalabi (2014), Al-Ghamdi study (2015), Al-Harbi study (2019), Al-Sabiba study (2020), and the study of Al-Shahrani and Al-Mahfouz (2021).

Table (13) Results of content analysis of the sixth grade mathematics book in the light of the skills of the twenty-first century

Number	Key skills	Percentage	degree of inclusion
1	Critical thinking and problem solving skill	47,%86	Highly Included
2	Creativity and innovation skill	%52,99	Medium Included
3	Collaboration and teamwork skill	%1.96	Very low included
4	Communication, information and media culture skill	%0.65	Very low included
5	Computing and information technology skills	%30.5	low included
6	Occupational skill and self-reliant learning	%23.04	Very low included
7	The ability to understand other cultures	%1.03	Very low included
Average percentage of 21st century skills	**%28 ,55**		**Very low included**

It is clear from the above that there is a clear and tangible decline in the inclusion of twenty-first century skills in the mathematics textbook for the sixth grade, where the results of the current study agree with the results of previous studies Al-Shalabi (2014), Al-Ghamdi (2015), Al-Harbi (2019), Al-Sabiba (2020), Al-Shahrani and Al Mahfouz (2020). It differs with the study of Al-Harbi and Al-Harbi (2021), which included the skills of the twenty-first century to a moderate degree in the mathematics book for the second intermediate grade in Saudi Arabia, and this may be attributed to the difference in the research sample.

Recommendations

Based on the results of the study, the researcher recommends the following:

1. Holding training courses, seminars and workshops for mathematics teachers on the importance of the twenty-first century skills in teaching mathematics and how to activate them during their teaching.

2. The need for the planners and developers of mathematics curricula to pay attention to the skills of the twenty-first century and to reconsider the mathematics books so as to focus on including the skills of the twenty-first century in a systematic and intentional manner.

Suggestions

Based on the results of the study, the researcher suggests the following

1- Preparing future studies on the extent to which mathematics teachers possess the skills of the twenty-first century.

2- A conceptualization of a proposed training program for developing the skills of the twenty-first century for mathematics teachers in the basic education stage.

3.- Preparing analytical studies for other academic subjects and different study stages in light of the skills of the twenty-first century.

References

[1] Abu Al-Hamael, Ahmed Abdel Hamid. (2013). The effectiveness of an enrichment program in science to develop life skills for sixth graders in Jeddah Governorate, Journal of the College of Education_Benha University, 24 (93), 11-182

[2] El-Baz, Marwa Mohamed. (2013). Developing the Science Curriculum for the Third Preparatory Class in the Light of Twenty-first Century Skills, Egyptian Association for Practical Education, Journal of Scientific Education, 16 (6), 7-49

[3] Terling, Bernie and Fadol, Charles. (2013). Twenty-first century skills (translated by Badr Al-Saleh). i 1. Riyadh: Scientific Publishing and Printing Press

[4] Argument, judgment. (2018). The extent to which science books for the upper basic stage include twenty-first century skills. Studies in Educational Sciences, 45(3), 163-178

[5] Al-Harbi, Ibrahim Suleiman Rizk. (2019). The extent to which twenty-first century

skills are included in the mathematics textbook for the third intermediate grade. Journal of the College of Education, Al-Azhar University, 183, 513-554

[6] Al-Harbi, Muhammad bin Sunt and Al-Harbi Nasser bin Suleiman. (2021). The level of inclusion of twenty-first century skills in the mathematics textbook for the second intermediate grade in the Kingdom of Saudi Arabia in light of the common dimensions of the Education and Training Evaluation Commission. International Journal of Research and Educational Sciences, 4(1) 447-495

[7] Hassan, Shaima Mohammed. (2015). Developing the Mathematics Curriculum for the Sixth Grade Primary in the Light of Twenty-first Century Skills, Journal of the College of Education, Port Said University, 18, 297-345

[8] Khatib Muhammed. (2010). The effect of using problem solving strategy on mathematical thinking and attitudes toward mathematics among seventh graders. The Teacher's Message, 3 (48): 23-27

[9] Rashid, Ali Mohieldin Abdel Rahman. (2017). The role of science education in developing learning skills in the twenty-first century. Nineteenth Scientific Conference. Practical education and sustainable development. Organized by the Egyptian Association for Practical Education, Guest House, Ain Shams University, Cairo, 225-238

[10] Al-Zahrani, Abdulaziz Othman. (2019). A proposed vision for developing the teaching practices of mathematics teachers in the light of twenty-first century skills. Umm Al-Qura Journal of Educational and Psychological Sciences, 11(1) 1-48

[11] Sobhi, Nasreen Hassan. (2016). The extent to which the skills of the twenty-first century are included in the premises of the developed sciences for the first intermediate grade in the Kingdom of Saudi Arabia. Journal of Educational Sciences - Prince Sattam bin Abdulaziz University, 1(1), 9-44

[12] Al-Sabiba, Saad Lewin. (2020). The extent to which the skills of the twenty-first century are included in the Arabic language book for the sixth grade in Jordan in the academic year 2018-2019 as a model. Journal of Educational and Psychological Sciences, (5) 45-63

[13] Shalaby, Nawal Mohamed. (2014). A proposed framework for integrating twenty-first century skills in science curricula in basic education in Egypt. Specialized International Educational Journal, Jordanian Psychological Association, Jordan, 3 (10), 1-33

[14] Al-Shahrani, Badriya Muhammad Saad and Al Mahfouz Muhammad Muhammad. (2020). Evaluating the content of science curricula at the intermediate stage in the light of the skills of the twenty-first century. Sohag University Educational Journal, (72), 417-468, 72

[15] Abdel Qader, Ayman Mustafa Mustafa. (2019). Evaluating the developed mathematics books at the primary stage in the light of the twenty-first century skills system: an analytical study. Journal of the College of Education, Mansoura University.2(107), 666-715

[16] Omari, Wisal. (2020). Inclusion of twenty-first century skills in physics textbooks for the upper basic stage in Jordan: an analytical study. The Jordanian Journal of Educational Sciences, (16) 4, 461-475

[17] Al-Awadi, Huda Muhammad and Al-Shaya, Salah Suleiman and Al-Murshed, Abdul-Rahman Abdul-Aziz and Al-Damakhi, Abdullah Ibrahim. (2011). TIMSS International Examinations Guide. Education Bureau for the Gulf States

[18] Eid, Somaya. (2019). Analysis of the content of technology books for the basic stage in the light of the skills of the twenty-first century, and the extent to which tenth grade students acquire them. [Unpublished Master's Thesis]. Islamic University. Gaza

[19] Al-Ghamdi, Muhammad bin Fahm. (2015). Analysis of the content of mathematics books for the upper grades of the primary stage in the light of the skills of the twenty-first century. [Unpublished Master's Thesis]. Faculty of Social Sciences. Imam Muhammad Bin Saud Islamic University

[20] Al-Laqani, Ahmed Hussein and Al-Jamal, Ali Ahmed. (2003). A Dictionary of Educational Terminology Knowledge in Curricula and Teaching Methods, 2nd Edition, Cairo: The World of Books

[21] Al-Huwaish, Youssef Muhammad. (2018). Professional development for teachers in the Kingdom of Saudi Arabia. In light of the skills of the twenty-first century.

Journal of the College of Education - Ain Shams University, (42), 247-282.
[22] Scott, Cynthia Luna. (2015).The Future of Learning2: what kind of Learning for 21st Century?.
[23] The National Center for Human Resources Development. (2003).The Level Performance of Jordanian student in the third international study of mathematics and science "TIMSS2003", 107, Amman Jordan.
[24] The National Center for Human Resources Development. (2007).The Level Performance of Jordanian student in the third international study of mathematics and science "TIMSS2003", 153, Amman Jordan.
[25] The National Center for Human Resources Development. (2011).The Level Performance of Jordanian student in the third international study of mathematics and science "TIMSS2003".170.Amman Jordan.
[26] The National Center for Human Resources Development. (2015).National report on a study of the International pisa student Assessment Program"PISA2015", Amman, Jordan.
[27] The National Center for Human Resources Development. (2015).The Level Performance of Jordanian student in the third international study of mathematics and science "TIMSS2003", 183, Amman Jordan.
[28] The National Center for Human Resources Development. (2018).National report on a study of the International pisa student Assessment Program"PISA2018", Amman, Jordan.
[29] The Partnership for 21st Century Skills (2015). Framework for 21st Century Learning. http://www.p21.org-our_work/p21_framework.
[30] Van Laar. Ester, Van Deursen. Alexander J. A. M, Van Dijk. Jan A. G. M, De Haan. Jos (2017). The Relation Between 21st Century Skills and Digital Skills: systematic Literature Review, Computers in Human Behavior, 72, 577-588.
[31] Warner,S.,& Kaur,A.(2017).The Perception of Teacher and Students on a 21st Century mathematics Instructional Model. International Electronic Journal of Mathematics Education, 12(2), 193-215
[32] Abu Al-Hamael, A. A. (2013), the effectiveness an enrichment program in science to develop life skills for sixth graders in Jeddah, Journal of the College Education, Banha University 24(93) 182-11. [In Arabic]
[33] El-Baz, M. M. M. (2013).Developing the science curriculum for the third preparatory grade in the light of the skills of the twenty first century, Egyptian Association for Scientific Education, The Egyptian Journal of Scientific Education, 16(6), 191-231. [In Arabic]
[34] Kumar, S. (2022). A quest for sustainium (sustainability Premium): review of sustainable bonds. Academy of Accounting and Financial Studies Journal, Vol. 26, no.2, pp. 1-18
[35] Allugunti V.R (2022). A machine learning model for skin disease classification using
[36] convolution neural network. International Journal of Computing, Programming and Database
[37] Management 3(1), 141-147
[38] Terling, B & F, Charles. (2013).Twenty-First Century skills: learning for life in our times (translation AL Saleh. Badr bin Abdallah). Riyadh: Scientific publishing and printing press.
[39] Hajja, H. (2018).The extent included book of the science for higher basic stage for 21st Century skills. Studies –Educational Science, 45 (3), 163-178. [In Arabic]
[40] AL-Herby, I. S.R. (2019).The Extent to the 21st century skills are Included in the Mathematics Book of the Third Year Preparatory Stage. Journal of faculty Education, AL-Azhar University- faculty of Education.183, 512-554. [In Arabic]
[41] AL-Harbi, M. S& AL-Harbi N. S. (2021).The Level of Inclusion of 21st century skills in the mathematics textbook for the second intermediate grade in The Kingdom of Saudi Arabia in light of the mutual dimension of the Education and Training Evaluation Commission .International Journal of Research in Educational Sciences,4(1),447-495. [In Arabic]
[42] Hassan, S. M. (2015). Developing the Mathematics Curriculum for the Primary Class in the Light of the One-Century Skills, Journal of the College of Education, Port Said University, 18, 297-345. [In Arabic]

[43] Al-Khatib. M. (2010). The effect of using problem-solving strategy on mathematical thinking and attitudes toward mathematics among seventh graders. The Teacher's Message, 3 (48): 23-27. [In Arabic]

[44] Rashid, A. M. A. (2017). The role of science teaching in developing learning skills in the twenty-first century. Nineteenth Scientific Conference. Practical education and sustainable development. Organized by the Egyptian Association for Practical Education, Guest House, Ain Shams University, Cairo, 225-238. [In Arabic]

[45] Al-Zahrani, A.O. (2019). A proposed scenario for developing teaching practices for mathematics teachers 'perception of 21st century skills. Umm Al-Qura Journal of Educational and Psychological Sciences, 11(1) 1-48. [In Arabic]

[46] Sobhi, N. H. (2016). The extent to which the skills of the twenty-first century are included in the developed science headquarters for the first intermediate grade in the Kingdom of Saudi Arabia. Journal of Educational Sciences - Prince Sattam bin Abdul-Aziz University, 1(1), 9-44. [In Arabic]

[47] ALSibieh, S. L. (2020). The extent of inclusion of the skills of the twenty-first century in the Arabic language book for the sixth grade in Jordan The academic year 2018-2019 is a model. Journal of Educational and Psychological Sciences, (5) 45-63. [In Arabic]

[48] Shalaby, N. M. (2014). A proposed framework for integrating twenty-first century skills in science curricula in basic education in Egypt. Specialized International Educational Journal, Jordanian Psychological Association, Jordan, 3 (10), 1-33. [In Arabic]

[49] Al-Shahrani, B.M.S & Al Mahfouz M .M (2020). Evaluating the content of science curricula at the intermediate stage in the light of the skills of the twenty-first century. Educational Journal of Sohag University, (72), 72 417-468. [In Arabic]

[50] Abdel Qader, A. M. M. (2019). Evaluating the developed mathematics books at the primary stage in the light of the twenty-first century skills system: an analytical study. Journal of the College of Education, Mansoura University.2 (107), 666-715. [In Arabic]

[51] Al-Omari, W. (2020). Embedding the 21st Century Skills in Physics Textbooks for the Higher Basic Stage in Jordan: An Analytical Study. The Jordanian Journal of Educational Sciences, (16) 4, 461-475. [In Arabic]

[52] Al-Awadi, H. M. & Al-Shaya, S. S & Al-Murshed, A. A & Al-Damaikhi, A. I. (2011). TIMSS International Exam Guide. Bureau of Education for the Gulf States. [In Arabic]

[53] Eid, S. (2019). Content Analysis of Elementary School Technology Textbooks in the Light of the Twenty First Century Skills and the Extent of their Acquisition by Tenth Graders. [Unpublished Master's Thesis]. Islamic University. Gaza. [In Arabic]

[54] Al-Ghamdi, M. F. (2015). Analysis of the content of mathematics books for the higher grades of the primary stage in the light of the skills of the twenty-first century. [Unpublished Master's Thesis]. Faculty of Social Sciences. Imam Muhammad Bin Saud Islamic University. [In Arabic]

[55] Al-Laqani, A. H. & Al-Jamal, A. A. (2003). A Dictionary of Educational Terms, Knowledge in Curricula and Teaching Methods, 2, Cairo: World of Books. [In Arabic]

[56] Al-Huwaish, Y. M. (2018). Professional development for teachers in the Kingdom of Saudi Arabia In light of the skills of the twenty-first century. Journal of the College of Education - Ain Shams University, (42), 247-282. [In Arabic]