International Education Studies; Vol. 12, No. 4; 2019
ISSN 1913-9020 E-ISSN 1913-9039
Published by Canadian Center of Science and Education

Critical Thinking Skills in Elementary School Curricula in some Arab Countries—A Comparative Analysis

Raja Omar Bahatheg[1]

[1] College of Education, King Saud University, Saudi Arabia

Correspondence: Raja Omar Bahatheg, Associate Professor, College of Education, King Saud University, Saudi Arabia.

Received: April 27, 2018 Accepted: October 5, 2018 Online Published: March 25, 2019

doi:10.5539/ies.v12n4p217 URL: https://doi.org/10.5539/ies.v12n4p217

Abstract

This study aims to analyze and compare school subjects to determine the extent to which critical thinking skills are being engaged in school subjects' questions and activities in public education. Five Arab countries are included in this paper; Saudi Arabia, Kuwait, The Hashemite Kingdom of Jordan, Arab Republic of Egypt, and The Tunisian Republic, in elementary school levels (first, second, and third grades.)The study found that all Arab countries focus on operating inductive reasoning skills in their subjects, followed by reasoning and observation, sequentially, while dismissing credibility and assumptions skills. Saudi Arabia focused on developing critical thinking skills in science textbooks for the past three academic years, while Kuwait had the same focus on their Arabic language classes. Both the Hashemite Kingdom of Jordan and Egypt have paid a measurable attention to engaging critical thinking skills in Mathematics and the Arabic language, as well as Tunisia in their science textbooks. The least effective subjects in operating critical thinking skills were the Arabic language in Saudi Arabia, science in Kuwait, Domestic Economics in Egypt, and Islamic education in Jordan and Tunisia.

Keywords: critical, thinking, skills, elementary education, Arab countries, primary, curriculum

1. Introduction

Critical thinking and its theories were based on John Dewey's idea of reflective thinking, where Dewey linked the process of thinking to the product of thinking. Dewey (1910) also described reflective thinking that it helps speculation in problem solving or reformulating problem solution and the development of hypotheses. He confirmed that education helps develop problem-solving skills, and he also stressed the importance of teaching students and integrating experience and thinking within the curriculum. The results of some research studies point out that young children are engaged in many cognitive processes that the same ones adults perform, and concluded that there is an importance and status for critical thinking in elementary education curricula (Gelman & Markman, 1986), where it was noted that there was no specific age for when children are ready to develop for knowledge and learning of critical thinking (Silva, 2008).

1.1 Theoretical Background

Critical thinking has evolved over the past century, defined by McPeck (1981) that it is the skill and the temptation to engage in activity with reverse doubts, and that requires knowledge of the subject or field. Ennis (1985) also defined it as a reflective thinking that focuses on making decisions, which reflect what we believe in or do. Ennis pointed out that it is a skill that requires suspicions and knowledge of the subject, and he defined it as making a decision that depends on what we believe in.

Both Watson and Glaser developed a definition for critical thinking, where they added past experience, skills, scrutiny, evaluation, and logical evidence. They defined critical thinking as knowing the methods of reasonable and logical thinking; a situation processed through looking deeply into the problems and issues raised by a previous experience; a compound of situations, knowledge and skills (Watson & Glaser, 1991).

Critical thinking may be a confrontation between two complicated dilemmas, which are what we do and believe in, and a new phenomenon that differs from what we are used to. Braman (1998) used the phrase "disorienting dilemma," to describe a reflective or critical ongoing situation that is contrary to what we know or believe in. Critical thinking is a dynamic process of exposure, exploration, evaluation and practice. All views of researchers agreed that one of the qualities of critical thinking is trying to reach a decision, as indicated by Hatcher &

Spencer (2000) that critical thinking is evaluating points of view and making a decision or judgment based on evidence. This definition refers to two important processes, which are evaluation and decision-making.

Kong and Seng (2006) added that critical thinking engages the development of behavioral change, which includes the eagerness of the mind to investigate matters.

Costa and Kallick (2009) viewed cognitive skills in relation to problems and assessing the available information, where they defined critical thinking as the development and application of related cognitive skills and those that are engaged in problem solving, understanding and expression of meaning. In addition, critical thinking identifies relationships, assesses credibility of statements, and identifies the required elements to draw reasonable conclusions. Moreover, critical thinking coherently presents reflection results, which in turn lead to developing the habits of mind.

1.1.1 Critical Thinking and Educational Curricula

Critical thinking skills, standards, and objectives should be clear for all teachers in education and in school subjects that use skills as part of the course (Ennis, 2013). Globally, the aims of education in the curricula of primary, secondary and higher education emphasize the development of critical thinking among students. However, there are inconsistencies in how to interpret the aims of education, as some teachers seek to use separate classes to support students in these skills and not as a daily part of all lessons within the curriculum. Kennedy et al. (1991) and Jones (2004) discussed this particular point, where they noted that teachers, in all subjects and at all levels of education, must teach thinking, particularly critical thinking. However, this goal is sometimes affected by the unclarity or misunderstanding of methods or strategies for developing critical thinking among students.

There are different methods and strategies for teaching critical thinking and engaging it in educational curricula, as it is a process that requires the application and analysis to assess the information gathered through observation, discussing and evaluating the results, and rethinking causes (Center for Critical Thinking, 2011). Ikuenobe (2001) confirms that learners should understand the concept of an argument, classify relevant and important data by least important, explain the different kinds of indicative and identification relations; the basic principle of every argument, and also demonstrate the ability to analyze these arguments and pieces of evidence (Ramsay, Harding, Cools, & McLaren, 2009).

Research studies indicate that teachers have to include critical thinking skills and encourage learners to use critical thinking skills while learning, such as knowing the reasons, observation, and logic, which they are not limited to learning and developing at higher levels of education (Kennedy et al., 1991; Facione, 1990). Empirical studies proved to improve credibility of different sources of information for children of four years of age (Koenig & Harris, 2005).

1.1.2 Critical Thinking Skills

This research will review Facione, Watson, and Glaser's classifications in detail. There are six core critical thinking skills according to Facione (1990, 2000):

1) Interpretation:

This skill is represented in the individual's ability to give justifications or a logical explanation for a particular issue or a problem and extract a certain outcome (in the form of cause and effect) in light of the available facts that are accepted by everyone. On the other hand, it is a mental process meant to give meaning to the student's life experiences and learn lessons from. When a student interprets a certain experience, he/she explains the meaning inspired by the available information (Obeid, 2003).

2) Analysis of assumptions:

It is the ability to identify assumptions that work as a solution for a problem or an opinion about a given issue. Obeid (2003) defined it as the ability to examine facts and information included in a certain subject in a way that any individual can make judgment on it.

3) Evaluation of discussions (and judging the evidence):

It is the ability to distinguish between strengths and weaknesses in judging an issue or an incident to give justifications, and reach a conclusion in light of the available evidence, and in light of the available facts that are accepted by everyone.

4) Inference:

Inference is the ability to analyze given data, and it is also defined as the skill or mental ability that we use all of

what we know from knowledge and information in order to reach a vague or a missing conclusion. It is also defined as the executive mental ability that requires the learners to use their experiences and all the information they have available, to show the levels of accuracy or inaccuracy of a particular result, or explain a missing aspect of its aspects according to the level of its relativity to the given information (Obeid, 2003).

5) Explanation:

It is the ability to conclude new information based on previously known information, as well as the ability to link and find a relationship between facts or between specific given examples, so one can judge in light of this knowledge and know whether the result is entirely derived from these facts or examples or not, regardless of the accuracy of the given facts or the individual's position of them.

6) Self-regulation: which is one's ability to speculate, confirm credibility and organize ideas.

Watson and Glaser (1994) categorized critical thinking skills into the following:

1) Assumptions
2) Interpretation
3) Inference
4) Conclusion
5) Evaluating arguments

After reviewing the previous classifications of critical thinking skills, this research will adopt the following classifications of critical thinking skills:

1) Inductive reasoning (induction) which is an individual's ability to explain the meaning; give examples; the ability to conclude a main idea; interpretation; (who, when, where, what) to solve the problem.
2) Conclusion: It is an individual's ability to define and know interconnections and how to draw results or information through indirect observation.
3) Observation: An individual's ability to assort, compare, or match, as well as the ability to know the components.
4) Assumptions (identify): It is an individual's ability to share points of view, define relationships, probability, and resolve "what if" questions.
5) Credibility (Evaluation-Inference): an individual's capacity to mention evidence and proofs, and acknowledging sources with knowledge of how to verify information and their sources. (Bahathgq, 2017).

1.1.3 Critical Questions

Defined by Darwazeh (2000) as "an incentive that calls for a reaction and a response, and requires learners a sum of thought and examination of the educational material in their hands, and then retrieving stored information in their memory in a way to help find the right answer.

1.1.4 Critical Activities

It is defined as "they include everything that learners engage within and outside educational institutions in tasks that require mental, manual, or practical skills and ability, whether regular or irregular, bringing in more experiences that support their learning of a range of topics."

1.2 Problem Statement

This research aims to identify critical thinking skills that are included within the questions and activities of curricula in Arab countries for elementary grades.

1.3 Questions

This study is an attempt to answer the main question:

What are the critical thinking skills engaged in questions and activities of elementary school curricula?

This question branches out to the following questions:

1) what are the critical thinking skills engaged in questions and activities of elementary school curricula in Saudi Arabia?
2) what are the critical thinking skills engaged in questions and activities of elementary school curricula in Kuwait?

3) what are the critical thinking skills engaged in questions and activities of elementary school curricula in Egypt?
4) what are the critical thinking skills engaged in questions and activities of elementary school curricula in the Hashemite Kingdom of Jordan?
5) what are the critical thinking skills engaged in questions and activities of elementary school curricula in the Tunisian Republic?
6) what are the most engaged critical thinking skills in the common subjects in the five Arab countries compared in this research?

1.4 Objectives

The research aims to identify critical thinking skills in questions and activities of elementary school curricula (primary) for first, second, and third grades in some Arab countries (Saudi Arabia, Kuwait, Egypt, Jordan, and Tunisia).

1.5 Significance of Study

This research's significance is represented in:

- The scarcity of analytical studies to compare the critical thinking skills among Arab states.
- The importance of decision makers to pay attention and consider curriculum development to develop critical thinking skills among children in primary schools.
- The need to provide data to curriculum employees in Arab countries from planners, designers, implementers, and developers to understand critical thinking skills and take them into consideration in processing school curriculum for other levels.

1.6 Definitions

- *Questions*: defined by Darwazeh (2000) as "an incentive that calls for a reaction and a response, and requires learners a sum of thought and examination of the educational material in their hands, and then retrieving stored information in their memory in a way to help find right answer."
- *Critical Thinking Skills:* an individual's ability to induce, conclude, observe, assume and credit.

2. Method

The researcher used an analytical, descriptive approach to analyze content in order to achieve the objectives of the research, and to analyze the curriculum in the five mentioned Arab countries.

2.1 Analysis

In this research, three researchers (the researcher and two external specialist analysts of the field) analyzed school subjects from five Arab countries, where they discussed the bases on which they would perform their analysis and the most important procedures, then each researcher would analyze the material individually without discussing it with the other, and then compare the relationship between the results of each other (the researcher and analyst for a lesson in the Saudi curriculum, and the researcher and an analyst who studied a lesson in the Kuwaiti curriculum). To determine compatibility percentage, the researcher used Cooper's equation. After analyzing all lessons to calculate the constant coefficient, it was 89 percent, which was appropriate for this research.

2.2 Tools

In this study, school subjects for first, second, and third grades have been analyzed, which were (Tawhid and Al-Fiqh and Behavior, Mathematics, Science and My Language) of Saudi Arabia, the Ministry of Education, 2015 edition.

Also, Kuwaiti public schools' subjects 2011-2012, which were (Civic studies, Islamic studies, Mathematics, Science, Arabic Language, Life Skills, and Computer Science) were analyzed. Additionally, Egyptian public school subjects 2016-2017 were analyzed (Islamic Religion, Domestic Economics, Mathematics, and Arabic Language), where there were no science courses given to lower grades in Egypt.

Similarly, Jordanian public school subjects 2006 (Social and Civic Education, Islamic Education, Mathematics, Science and Arabic Language) were analyzed. Finally, the research also analyzed (Islamic Education, Reading, Mathematics and Science) from the Tunisian Republic, National Pedagogical Center, 2015 edition.

2.3 Statistical Methods Used in this Research

To achieve the results of this study, occurrences of each critical thinking skill have been monitored for every subject and grade, and compared with the occurrences of each other country's subjects. Also, the percentage of each critical thinking skill of each subject and country have been calculated and compared with the other countries' percentages.

3. Results and Discussion

To answer the first question, which was "what are the critical thinking skills engaged in questions and activities of elementary school curricula in Saudi Arabia?" the occurrences of the five critical thinking skills (induction, conclusion, observation, credibility, and assumption) have been calculated for all school subjects of first, second, and third grades. However, there was no analysis of the content of the Holy Koran and art education (because they support creative thinking), and the percentages of each skill have been calculated for all skills of each subject. Table 1 shows critical thinking skills in the educational subjects of Saudi Arabia.

As for the second grade, the arrangement of subjects in order of occurrences was the same, where science had the highest number of occurrences of 49 and a percentage of 32%, followed by Tawhid and Fiqh with 42 occurrences and a percentage of 28%, then Mathematics and finally with the least number of occurrences was the Arabic Language. It was noted that the percentage of science decreased from 51% in the first grade to 32% in the second grade, and the occurrences and percentage of the Arabic language increased from 10% to 19%. It was also noted from Table 1 that the observation skill was the most engaged in the second grade curriculum with 60 occurrences and a percentage of 39%, followed by induction with 49 occurrences and a percentage of 32%, then conclusion and assumption, while credibility scored 0 in all subjects.

Table 1. Critical thinking skills in the educational subjects of Saudi Arabia

School Year	Subject	Induction		Conclusion		Observation		Credibility		Assumption		Occurrence	Percentage
		Occurrence	Percentage	Occurrence	Percentage	Occurrence	Percentage	Occurrence	Percentage	Occurrence	Percentage		
First Grade	Tawhid, Fiqh	18	31%	0	0%	6	30%	3	75%	6	27%	33	23%
	Mathematics	1	2%	21	54%	0	0%	1	25%	0	0%	23	16%
	Science	35	59%	18	46%	13	65%	0	0%	7	32%	73	51%
	Arabic Language	5	8%	0	0%	1	5%	0	0%	9	41%	15	10%
Second Grade	Tawhid, Fiqh	16	33%	6	18%	18	30%	0	0%	2	20%	42	28%

	Mathematics	6	12%	11	33%	15	25%	0	0%	0	0%	32	21%
	Science	11	22%	13	39%	20	33%	0	0%	5	50%	49	32%
	Arabic Language	16	33%	3	9%	7	12%	0	0%	3	30%	29	19%
Third Grade	Tawhid, Fiqh	18	31%	0	0%	6	30%	3	75%	6	27%	33	23%
	Mathematics	1	2%	19	51%	0	0%	1	25%	0	0%	21	15%
	Science	35	59%	18	49%	13	65%	0	0%	7	32%	73	51%
	Arabic Language	5	8%	0	0%	1	5%	0	0%	9	41%	15	11%

As for the third grade, it was noted that there was a consistency in the order of the subjects, where science scored highest number of occurrences of 73 occurrences and a percentage of 51%, the same percentage in the first grade, followed by Tawhid and Fiqh with 33 occurrences and a percentage of 23%, followed by Mathematics and then the Arabic Language. Table 1 also shows that induction scored the highest occurrences of 59 and a percentage of 42%, followed by conclusion with 37 occurrences and a percentage of 26%, then assumption and in the fourth place observation, while the least occurrences were of credibility.

The results related to the second question, which is: what are the critical thinking skills engaged in questions and activities of elementary school curricula in Kuwait? Table 2 shows results related to critical thinking skills in Kuwaiti school subjects.

Table 2. Critical thinking skills in school subjects of Kuwait

School year	Subject	Induction		Conclusion		Observation		Credibility		Assumption		Occurrence	%
		Occurrence	%	Occurrence	%	Occurrence	%	Occurrence	%	Occurrence	%		

First Grade	Civil education	16	15%	4	10%	13	15%	0	0%	0	0%	33	13%
	Islamic Education	17	16%	12	30%	10	11%	1	33%	3	21%	43	17%
	Mathematics	6	6%	18	45%	11	13%	2	67%	8	57%	45	18%
	Science	3	3%	1	3%	9	10%	0	0%	0	0%	13	5%
	Arabic language	27	25%	3	8%	21	24%	0	0%	2	14%	53	21%
	Life skills	28	26%	2	5%	19	22%	0	0%	1	7%	50	20%
	Computer science	12	11%	0	0%	4	5%	0	0%	0	0%	16	6%
Second Grade	Civil education	8	6%	1	5%	13	20%	0	0%	0	0%	22	9%
	Education	13	9%	0	0%	7	11%	0	0%	0	0%	20	8%
	Mathematics	2	1%	13	59%	8	12%	0	0%	0	0%	23	10%
	Science	23	17%	4	18%	2	3%	0	0%	3	20%	32	13%

	Arabic Language	57	41%	0	0%	22	34%	0	0%	11	73%	90	38%
	Life Skills	9	7%	4	18%	8	12%	0	0%	1	7%	22	9%
	Computer Science	26	19%	0	0%	5	8%	0	0%	0	0%	31	13%
Third Grade	Civil education	13	10%	2	14%	0	0%	0	0%	0	0%	15	9%
	Islamic Education	26	20%	7	50%	6	38%	0	0%	4	31%	43	25%
	Mathematics	21	16%	4	29%	1	6%	0	0%	4	31%	30	17%
	Science	12	9%	0	0%	3	19%	0	0%	1	8%	16	9%
	Arabic Language	27	21%	1	7%	0	0%	1	100%	2	15%	31	18%
	Life Skills	7	5%	0	0%	6	38%	0	0%	1	8%	14	8%
	Computer science	22	17%	0	0%	0	0%	0	0%	1	8%	23	13%

Table 2 shows that for the first grade, occurrences of critical thinking skills in the Arabic Language was the highest, were there was 53 occurrences and a percentage of 21%, followed by Life Skills with 1% less and 50 occurrences, and in the third place was Mathematics with 45 occurrences and a percentage of 18%. Computer science was in the sixth and the last place with 16 occurrences and a percentage of 6%. Table (2) also shows that induction was the most engaged skill in the first grade in Kuwait with 109 occurrences and a percentage of 43%, followed by observation with 87 occurrences and a percentage of 34%. The least engaged critical thinking skill within the subjects was credibility with 3 occurrences and a percentage of 1%. As for the second grade, the

Arabic language was still first in engagement of critical thinking skills with 90 occurrences and a percentage of 38%, followed by science and computer science with a percentage of 13%. Islamic education was the least engaging of critical thinking skills with 20 occurrences and a percentage of 8%. It was noted that Life Skills stepped down to fourth place, while science and computer science have stepped up.

It was noted that the most engaging subjects of critical thinking skills were the Arabic language (first and second grades) and Islamic Education (third grade), while the least engaging subjects of critical thinking skills were science, Islamic education (second grade) and life skills (third grade). Table 2 also shows that induction is still in the first place as the most engaged critical thinking skill in subjects for the third grade in Kuwait with 128 occurrences and a percentage of 74%, followed by observation with 16 occurrences and a percentage of 9%, which is a big difference between the percentages of the two skills, followed by conclusion with 14 occurrences and a percentage of 8%, then assumption. Credibility scored 1 occurrence and a percentage of 1% for the first time, and Arabic language scored zero in all subjects.

The results related to the third question, which is: what are the critical thinking skills engaged in questions and activities of elementary school curricula in Egypt? Table 3 shows results related to critical thinking skills in the Egyptian school subjects.

Table 3. Critical thinking skills in school subjects of Egypt

School year	Subject	Induction		Conclusion		Observation		Credibility		Assumption		Occurrence	%
		Occurrence	%	Occurrence	%	Occurrence	%	Occurrence	%	Occurrence	%		
First Grade	Islamic Education	31	19%	0	0%	12	12%	0	0%	0	0%	43	16%
	Domestic economics	13	8%	0	0%	2	2%	0	0%	0	0%	15	5%
	Mathematics	44	27%	7	88%	70	67%	0	0%	0	0%	121	44%
	Arabic Language	76	46%	1	13%	20	19%	0	0%	0	0%	97	35%
Second Grade	Islamic Education	34	18%	3	27%	13	23%	0	0%	0	0%	50	19%
	Domestic economics	27	15%	0	0%	1	2%	0	0%	0	0%	28	11%

	Mathematics	46	25%	8	73%	23	41%	0	0%	0	0%	77	30%
	Arabic Language	79	42%	0	0%	19	34%	4	100%	0	0%	102	40%
Third Grade	Islamic Education	20	12%	0	0%	11	46%	0	0%	0	0%	31	14%
	Domestic economics	28	16%	0	0%	0	0%	2	67%	0	0%	30	13%
	Mathematics	40	23%	17	71%	6	25%	0	0%	0	0%	63	28%
	Arabic Language	84	49%	7	29%	7	29%	1	33%	0	0%	99	44%

In The Third grade Egyptian curriculum, it was noted that the Arabic language ranked first with 99 occurrences and a percentage of 44%, followed by Mathematics with 63 occurrences and a percentage of 28%, then Islamic education and finally Domestic Economics, which was the same order of subjects as The Second grade.

Table 3 shows that The First grade Mathematics and Second and Third grade Arabic language were the most engaging of critical thinking skills, where Domestic economics in all three grades was the least engaging of the skills. It was also noted that induction was still the most engaged skill in the Egyptian curricula, where induction skills occurred 172 times with a percentage of 77% in The Third grade, followed by observation and conclusion with the same number of occurrences and percentages of 24 and 11%. The least engaged critical thinking skill among subjects was assumption with zero occurrences and percentage. It was noted that the induction percentage was remarkably increasing through the three grades compared to conclusion and credibility's minor increase (0%-4%-3%).

The results related to the fourth question, which is: what are the critical thinking skills engaged in questions and activities of elementary school curricula in the Hashemite Kingdom of Jordan? Table 4 shows results related to critical thinking skills in the Jordanian school subjects.

Table 4. Critical thinking skills in school subjects of the Hashemite Kingdom of Jordan

School year	Subject	Induction		Conclusion		Observation		Credibility		Assumption		Occurrence	%
		Occurrence	%	Occurrence	%	Occurrence	%	Occurrence	%	Occurrence	%		
First grade	Social and civic education	51	20%	0	0%	8	6%	1	20%	0	0%	60	14%
	Islamic education	35	14%	2	6%	13	10%	1	20%	0	0%	51	12%
	Mathematics	51	20%	28	80%	60	48%	1	20%	0	0%	140	33%
	Science	29	11%	4	11%	18	14%	1	20%	0	0%	52	12%
	Arabic Language	92	36%	1	3%	26	21%	1	20%	0	0%	120	28%
Second grade	Social and civic education	56	29%	0	0%	7	12%	0	0%	1	100%	64	24%
	Islamic education	21	11%	0	0%	13	22%	0	0%	0	0%	34	13%
	Mathematics	3	2%	2	14%	8	13%	0	0%	0	0%	13	5%
	Science	31	16%	0	0%	7	12%	0	0%	0	0%	38	14%
	Arabic language	79	42%	12	86%	25	42%	2	100%	0	0%	118	44%

Third grade	Social and civic education	43	17%	2	13%	5	7%	0	0%	1	20%	51	15%
	Islamic Education	23	9%	0	0%	8	12%	0	0%	3	60%	34	10%
	Mathematics	33	13%	5	31%	15	22%	0	0%	0	0%	53	15%
	Science	55	21%	0	0%	4	6%	0	0%	1	20%	60	17%
	Arabic Language	102	40%	9	56%	36	53%	0	0%	0	0%	147	43%

Table 4 shows that the most engaging subjects of critical thinking skills were the First grade Mathematics and the Second and the Third grade Arabic language, while the least engaging subjects were first grade Islamic education, Second grade Mathematics, and Third grade Islamic education. It was also noted that induction was still the most engaged skill in Jordan, with 256 occurrences and a percentage of 74% in the Third grade, followed by observation with 68 occurrences and a percentage of 20%. The least engaged critical thinking skills among subjects were credibility with zero occurrences and percentage, and for the first time assumption occurred 5 times with a percentage of 1%. It was noted that the induction percentage has remarkably increased through the three grades unlike observation and conclusion, which were in decrease according to their percentages. As for credibility, the percentage was a very low 1% for two grades, and assumption scored a notable decrease with 1% for one school grade.

The results related to the forth question, which is: what are the critical thinking skills engaged in questions and activities of elementary school curricula in the Tunisian Republic? Table 5 shows results related to critical thinking skills in Tunisian school subjects.

Table 5. Critical thinking skills in school subjects of the Tunisian Republic

School year	Subject	Induction		Conclusion		Observation		Credibility		Assumption			
		Occurrence	%	Occurrence	%	Occurrence	%	Occurrence	%	Occurrence	%	Occurrence	%
First grade	Islamic education	21	27%	4	11%	2	4%	0	0%	0	0%	27	16%
	Reading	3	4%	23	64%	18	36%	0	0%	0	0%	44	27%
	Mathematics	32	41%	5	14%	20	40%	0	0%	1	100%	58	35%
	Science	22	28%	4	11%	10	20%	0	0%	0	0%	36	22%
Second Grade	Islamic Education	23	23%	0	0%	6	15%	0	0%	0	0%	29	15%
	Reading	5	5%	14	33%	9	23%	0	0%	1	50%	29	15%
	Mathematics	8	8%	20	47%	8	21%	0	0%	1	50%	37	20%
	Science	65	64%	9	21%	16	41%	3	100%	0	0%	93	49%
Third Grade	Islamic Education	25	47%	0	0%	7	20%	0	0%	0	0%	32	20%
	Reading	12	23%	0	0%	0	0%	8	89%	5	18%	25	16%

Mathematics	10	19%	28	82%	4	11%	0	0%	8	29%	50	31%
Science	6	11%	6	18%	24	69%	1	11%	15	54%	52	33%

Table 5 shows that for the First grade in Tunisia, the occurrences of critical thinking skills in Mathematics are the highest, with 58 occurrences and a percentage of 35%, followed by reading with 44 occurrences and a percentage of 27%, then Science, and in the last place was Islamic education with 27 occurrences and a percentage of 16%. It was also noted from Table 5 that induction was the most engaged critical thinking skill in the first grade with 78 occurrences and a percentage of 47%, followed by observation with 50 occurrences and a percentage of 30%. The least engaged critical thinking skill among subjects was credibility with zero occurrences and percentage.

As for the Second grade, it was noted that Science ranked first with 93 occurrences and a percentage of 49%, followed by Mathematics with 37 occurrences and a percentage of 20%, then reading and Islamic education with the same percentage of 15%. It was also noted from Table 5 that induction was still the most engaged, where the occurrences of induction in the Second grade were 101 with a percentage of 71%, followed by conclusion with 43 occurrences and a percentage of 23%. The least engaged critical thinking skill among subjects was assumption with 2 occurrences and a percentage of 1%.

As for the Third grade in the Tunisian Republic, it was noted that Science ranked first with 52 occurrences and a percentage of 33%, which was the same rank in the Second grade, followed by Mathematics with 50 occurrences and a percentage of 31%, then Islamic education and in the last place came reading with 25 occurrences and a percentage of 16%.

The results concerning the sixth question, which is: "what are the most engaged critical thinking skills in the common subjects (Islamic education, Mathematics, Arabic language, Science) in the five Arab countries compared in this research?"

After presenting the analysis for subjects and critical thinking skills in the five Arab countries, common subjects between countries will now be compared in terms of critical thinking skills, with the different names of subjects like Tawhid, Fiqh, Islamic Religion or Islamic Education, as well as science and scientific awareness, so the comparison will be between (Islamic education, Mathematics, the Arabic language, and Science.)

Table 6 shows the occurrences of critical thinking skills in Islamic education for the five countries.

Table 6. Occurrences of critical thinking skills in Islamic education for the five countries

Country	School year	Induction	Conclusion	Observation	Credibility	Assumption
Saudi Arabia	First	18	0	6	3	6
	Second	16	6	18	0	2
	Third	18	0	6	3	6
Kuwait	First	17	12	10	1	3
	Second	13	0	7	0	0
	Third	26	7	6	0	4
Egypt	First	31	0	12	0	0
	Second	34	3	13	0	0
	Third	20	0	11	0	0
Jordan	First	35	2	13	1	0
	Second	21	0	13	0	0
	Third	23	0	8	0	3
Tunisia	First	21	4	2	0	0
	Second	23	0	6	0	0
	Third	25	0	7	0	0

It was noted from the occurrences in Table 6 that induction was the most engaged critical thinking skill in this subject compared to other skills, followed by observation and then conclusion and assumption, and finally credibility. It was also noted that in the first grade in Jordan, occurrences scored 35 times which is the most engaging country for critical thinking skills in Islamic education (knowing that it has scored the least engaging subjects of critical thinking skills compared to subjects of the first grade in Jordan). Ranked in second place was Egypt with 34 occurrences (the subject did not score highest occurrences when compared to other subjects of the country), and then followed by the second grade in Kuwait, where induction occurred 26 times. First grade in Kuwait scored the least occurrences of 17, which was the least grade to engage induction skills, followed by Saudi Arabia in all three grades.

The five countries focused on induction, which is a skill that helps develop knowledge for students, compared to credibility and assumption that were notably low in Islamic education among the five countries in this research. This result goes against what Al-Aklabi (2008-2012) found that curricula provide all critical thinking skills in Islamic education. Conclusion also ranked first in Al-Ghanbosi's study (2007) in Islamic education, while conclusion ranked third in this research preceded by induction and observation.

Hatcher and Spencer confirmed the importance of teaching critical thinking skills to students in curricula, which was also agreed to by Halpern (2000) earlier that it was important to teach critical thinking skills in education curricula and work, but this research found weakness in some skills like credibility and assumption, which was confirmed by Bedewi (2008) and Al-Jallad's (1997) studies. Table 7 shows the occurrences of critical thinking skills in Mathematics among the five Arab countries analyzed in this research.

Table 7. Occurrences of critical thinking skills in mathematics for the five countries

Country	School year	Induction	Conclusion	Observation	Credibility	Assumption
Saudi Arabia	First grade	1	21	0	1	0
	Second grade	6	11	15	0	0
	Third grade	1	19	0	1	0
Kuwait	First grade	6	18	11	2	8
	Second grade	2	13	8	0	0
	Third grade	21	4	1	0	4
Egypt	First grade	44	7	70	0	0
	Second grade	46	8	23	0	0
	Third grade	40	17	6	0	0
Jordan	First grade	51	28	60	1	0
	Second grade	3	2	8	0	0
	Third grade	33	5	15	0	0
Tunisia	First grade	32	5	20	0	1
	Second grade	8	20	8	0	1
	Third grade	10	28	4	0	8

Induction was still the most engaged skill compared to other critical thinking skills in Mathematics. It was noted from Table 7 that the First grade in Jordan scored the highest number of occurrences of 51 followed by all grades in Egypt, while engagement of induction in Saudi Arabia in Mathematics was the lowest among all grades.

It was also noted that observation came second after induction in its engagement in Mathematics, where the occurrences for the First grade in Egypt were 70, followed by the First grade in Jordan with 60 occurrences. The lowest occurrences of observation in Mathematics were in the Third grade in Saudi Arabia with zero occurrences, followed by the Third grade in Kuwait with one occurrence, then the Third grade in Tunisia with four occurrences.

Conclusion was the third in terms of the most engaged skills in Mathematics for the five countries, where the First grade in Jordan had the highest number of occurrences of 28, as well as the Third grade in Tunisia, followed by the First grade in Saudi Arabia with 21 occurrences. The Second grade in Jordan had the least number of occurrences of two, followed by the Third grade in Kuwait with four occurrences. The First grade in Kuwait and the Third grade in Tunisia were the most engaging grades for assumption with eight occurrences, unlike Egypt and Saudi Arabia, where they were the least engaging of assumption with zero occurrences. The First grades in Kuwait, Saudi Arabia, and Jordan were the most engaging of credibility with a low two

occurrences in Kuwait and one occurrence in both Saudi Arabia and Jordan, while all other grades scored zero for assumption.

After comparing Mathematics in all five countries, Jordan was the most engaging of critical thinking skills. Remaining countries should study the Jordanian Mathematics curriculum and seek to engage critical thinking skills in their Mathematics curricula. It was also noted that credibility and assumption were still the weakest in terms of engagement among all countries when compared to induction and observation in Islamic education and Mathematics.

Table 8. Occurrences of critical thinking skills in the arabic language for the five countries

Country	School year	Induction	Conclusion	Observation	Credibility	Assumption
Saudi Arabia	First grade	5	0	1	0	9
	Second grade	16	3	7	0	3
	Third grade	5	0	1	0	9
Kuwait	First grade	27	3	21	0	2
	Second grade	57	0	22	0	11
	Third grade	27	1	0	1	2
Egypt	First grade	76	1	20	0	0
	Second grade	79	0	19	4	0
	Third grade	84	7	7	1	0
Jordan	First grade	92	1	26	1	0
	Second grade	79	12	25	2	0
	Third grade	102	9	36	0	0
Tunisia	First grade	3	23	18	0	0
	Second grade	5	14	9	0	1
	Third grade	12	0	0	8	5

It was noted from Table 8 that Jordan was the most engaging of inductive reasoning in all three grades with occurrences (102-97-79), followed by Egypt in all three grades with (84-79-76) occurrences. First and third grade in Saudi Arabia were the least engaging of induction with only five occurrences, as well as Second grade in Tunisia with the same number of occurrences. It was also noted that observation came second after induction in terms of engagement in the Arabic language, where Jordan was again the most engaging of observation in all three grades of (36-26-25) occurrences, while First grade in Tunisia was the least engaging of observation with zero occurrences preceded by First grade and Third grade in Saudi Arabia with one occurrence.

Table 9. Occurrences of critical thinking skills in science for the five countries

Country	School year	Induction	Conclusion	Observation	Credibility	Assumption
Saudi Arabia	First grade	35	18	13	0	7
	Second Grade	11	13	20	0	5
	Third grade	35	18	13	0	7
Kuwait	First grade	3	1	9	0	0
	Second grade	23	4	2	0	3
	Third grade	12	0	3	0	1
Jordan	First grade	29	4	18	1	0
	Second grade	31	0	7	0	0
	Third grade	55	0	4	0	1
Tunisia	First grade	22	4	10	0	0
	Second grade	65	9	16	3	0
	Third grade	6	6	24	1	15

It was noted from Table 9 that Egypt does not teach science for earlier elementary grades, so it was not compared to the other Arab countries. All three grades in Saudi Arabia were the most engaging of conclusion with (18, 13, 18) occurrences, and Second and Third grades in Jordan and Third grade in Kuwait were the least engaging of conclusion with zero occurrences. Jordan, Tunisia and Saudi Arabia were remarkable in engaging critical

thinking skills in science, where Third grade in Tunisia was the most engaging with 15 occurrences, followed by all three grades in Saudi Arabia with (7,5,7) occurrences. Credibility was the least engaged skill compared to the other four, where it was only engaged in Second grade in Tunisia with three occurrences, then Third grade in Tunisia and First grade in Jordan with one occurrence. All other grades scored zero occurrences in this skill.

It was noted from the aforementioned that curricula in all five countries focus greatly on inductive reasoning and observation, while assumption was poorly engaged, and credibility was rarely engaged in most subjects in all Arab countries.

Facione (2000) stressed that educators should turn their attention to develop positive attitudes towards critical thinking among students from an early age to yield building their personalities and their capacity for viewing issues critically. Al Harahsheh (2014) also illustrates that critical thinking respects students' independence and encourages them to discover information and use their skills and background knowledge to think for themselves, because giving students the facts or clarifying the proper ways to solve a problem only negatively affects their ability to criticize or modify the new learnt knowledge. This is an invitation for those interested in educational curricula and developing critical thinking skills in them, especially in Arabic language and Islamic education.

4. Recommendations

In light of the results of this study, the researcher recommends the following:

- Curricula designers in Saudi Arabia should turn their attention to developing critical thinking skills in the Arabic language in all three elementary grades of the public education.
- Curricula designers in Kuwait should turn their attention to developing critical thinking skills in Science and Islamic education in their public education.
- Curricula designers in Egypt should turn their attention to developing critical thinking skills in Domestic economics in all three elementary grades of public education.
- Curricula designers Jordan should turn their attention to developing critical thinking skills in Islamic Education in their public education.
- Curricula designers in the Tunisian Republic should turn their attention to developing critical thinking skills in Islamic Education and Reading in their public education.
- Curricula designers should benefit from Mathematics and the Arabic language curriculum in Egypt and Jordan in developing critical thinking skills.
- Curricula designers should pay more attention to develop credibility and assumption skills.

References

Abu Zeina, F. (2010). *Developing Mathematics curriculum and learning*. Jordan, Amman: Wael publishing house.

Al-Ghanbosi, M. (2007). *The availability of critical thinking skills in Islamic education curriculum in the Sultanate of Oman* (Master thesis, University of Arab League, Institute of Research and Arab Studies).

Al Harahsheh, K. (2014). The effect of an educational program based on the strategy of imagination in science education on developing critical thinking towards education for elementary school students in Jordan. *Journal of the Association of Arab universities for education and psychology, 12*(1), 188-221.

Al Maghribi, N., & Al-Jabiri, S. (2007). *The engaged thinking skills in Palestinian Mathematics curriculum's exercises and questions for middle school in Algebra*. Presented to the educational conference, Ministry of education for educational training, 16-17 December.

Al Najjar, I. (2012). Evaluation of Science books questions in primary education and its activities in light of the goals of Saudi Arabia. *The faculty of education in Ain Shams University, Cairo, 6*(1).

Al Qaisi, T. (2014). The effect of using Marzano module of learning in math reasoning and the trend towards Mathematics in primary school students in the province of Tafilah. *The International Specialized Educational Journal, 3*(12), 233-250.

Al Sharqi, M. (2005). Critical thinking among first secondary school students in Riyadh and its relationship with some variables. *Journal of Psychology and Educational Sciences, 6*(2), 89-116.

Al-Aklabi, M. (2008). *The effectiveness of collaborative learning strategy in teaching Islamic culture and Hadith on academic achievement and critical thinking skills for first secondary grade students* (PhD, Umm al-Qura University, Mecca, faculty of education).

Al-Jallad, M. (2007). The effect of using brainstorming in teaching Islamic education on academic achievement and developing creative thinking skills for fifth grade students in the United Arab Emirates. *Umm al-Qura University Journal of educational and social sciences and humanities, 19*(2), 57-104.

Al-Maliki, A. (2011). Mental skills to employ the content of Islamic education to higher elementary grades students. *The Saudi Association for Science Education and Psychology (Justin), 36*, 143-175.

Ambo Saidi, K., & Suleiman, M. (2011). *Science teaching methods, practical concepts applications* (2nd ed.). Amman, Jordan: Daar Al Maseera for publication and distribution.

Bahatheq, R. (2017). *Engaged critical thinking skills in self-taught curriculum for kindergarten*. Under publication.

Bedewi, T. (2008). *Teaching skills for Sharia sciences in middle and high schools: A comparative study of public and private schools in the city of Riyadh*. The Saudi Association for Educational and Psychological sciences, 29.

Braman, R. (1998). Teaching peace to adults: Using critical thinking to improve conflict resolution. *Adult Learn, 102*(2), 30-32. https://doi.org/10.1177/104515959901000209

Brink-Budgen, R. (2000). Critical Thinking for Students. Oxford: How to Books.

Castle, A. (2009).Helping health professional students to develop their critical thinking skills. *International Journal of Therapy and Rehabilitation, 16*(11), 582-583. https://doi.org/10.12968/ijtr.2009.16.11.44937

Center for Critical Thinking. (2004). Retrieved June 5, 2016 from http://www.criticalthinking.org/starting/Begin-CTModel.cfm

Costa, A., & Kallick, B. (2009). *Habits of mind across the curriculum. Practical and creative strategies for teachers*. Alexandria, VA: Association for Supervision and Curriculum Development.

Cottrell, S. (2005). *Critical Thinking Skills: developing effective analysis and argument*. Palgrave MacMillan, Basingstoke.

Darwazeh, A. (2000). *The theory of teaching and its scientific translation*. Amman: Daar Al Shuroq for Publishing and Distribution

Dewey, J. (1910). *How we think*. Boston, D.C: Heath& CO. https://doi.org/10.1037/10903-000

Ennis, R. (1985). A logical basis for measuring critical thinking. *Educational Leadership, 4*, 44-54.

Ennis, R. (2013). Critical thinking across the curriculum: The Wisdom CTAC Program. *Inquiry: Critical Thinking across the Curriculum, 28*(2). 25-45. https://doi.org/10.5840/inquiryct20132828

Facione, P. (1990). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction*. Millbrae, CA: The California Academic Press.

Facione, P. (2000). The disposition toward critical thinking: Its character, measurement, and relation to critical thinking skill. *Informal Logic, 20*(1), 61-84. https://doi.org/10.22329/il.v20i1.2254

Fisher, A., & Scriven, M. (1997). Critical thinking: Its definition and assessment. Point Reyes, CA: Edgepress.

Gelman, S., & Markman, E. (1986). Categories and induction in young children. *Cognition, 23*, 183-209. https://doi.org/10.1016/0010-0277(86)90034-X

Hatcher, D., & Spencer, L. (2000). *Reasoning and writing: From critical thinking to composition*. Boston: American Press.

Heyman, G., & Legare, C. (2005). Children's evaluation of sources of information about traits. *Developmental Psychology, 41*(4), 636-647. https://doi.org/10.1037/0012-1649.41.4.636

Howie, S. (2007). *Third International Mathematics and Science Study-Repeat (TIMSS-R): What changed in South African pupils' performance in Mathematics between 1995-1998*. Retrieved from http://amesa.org.za/TIMSSR.htm, on 5 January 2017

Ikuenobe, P. (2001). Teaching and assessing critical thinking abilities as outcomes in an informal logic course. *Teaching in Higher Education, 6*(1), 19-35. https://doi.org/10.1080/13562510020029572

Jones, A. (2004). Teaching critical thinking: An investigation of a task in introductory macroeconomics. *Higher Education Research & Development, 23*(2), 167-181.

Kennedy, M., Fisher, M., & Ennis, R. (1991). Critical thinking: Literature review and needed research. In L. Idol,

& B. F. Jones (Eds.), *Educational values and cognitive instruction: Implications for reform*. Hillsdale, NJ: Erlbaum.

Kifafi, A. (2000). *Why and how to teach critical thinking to our children*. Twelfth international scientific conference of the Curriculum and Teaching methods association. Egypt: Daar Al Deyafa, Ain Shams University.

Koenig, M., & Harris, P. (2005). Preschoolers mistrust ignorant and inaccurate speakers. *Child Development, 76*(6), 1261-1277. https://doi.org/10.1111/j.1467-8624.2005.00849.x

Kong, G., & Seng, A. (2006). *Enhancing the critical thinking skills and dispositions of pre-service teachers*. Paper presented at the 7th National Conference of the International Association for Cognitive Education in Southern Africa, Vanderbijl park (pp. 51-75).

McPeck, J. (1981). *Critical thinking and education*. New York, NY: St. Martin's Press.

Meena, F. (2003). *Cases in school curricula*. Cairo: The Egyptian library of Anglo.

Mohammed. (2008). The effectiveness of problem solving strategy on measuring and developing some critical thinking skills for children in kindergarten. *Childhood studies*, 27-71.

National Middle School Association, NMSA. (2010). *This we believe: Keys to educating young Adolescent. Executive Summary*. Retrieved from http://www.nmsa.org/

Obeid, W. (2003). *Thinking and school curricula*. Beirut, Lebanon: Al Falah library of publication and distribution.

Pachtman, A. (2012). Developing Critical Thinking for the Internet. *Research and Teaching in Developmental Education, 29*(1), 39-47.

Ramsay, P., Harding, V., Cools, J., & McLaren, I. (2009). *Blooming with the Pouis: Critical thinking, reading and writing across the curriculum*. Miami, Florida: Ian Randle.

Silva, E. (2008). *Measuring Skills for the 21st Century* [Report]. Washington, DC: Education Sector. Retrieved from http://www.educationsector.org/usr_doc/MeasuringSkills.pdf

Suleiman, R. (2006). The effectiveness of a proposed strategy based on a researching teacher for the development of critical thinking for primary school students in Mathematics. *Journal of Psychology and Educational Sciences, 3*, 6-27.

Watson, G., & Glaser, E. (1991). *Watson-Glaser critical thinking appraisal*. Sidcup, Kent: The Psychological Corporation Ltd.

Watson, G., & Glaser, E. (1994). *Watson-Glaser Critical Thinking Appraisal, Form S manual*. San Antonio, TX: The Psychological Corporation.

Willingham, D. (2007). Critical thinking: Why is it so hard to teach? American Educator, 8-19.Worrow. (2004). Reflection and critical reasoning in education contexts. In A. Coles (Ed.), *Teaching in Post-Compulsory Education* (155171). David Fulton, London.

Notes

Note 1. This is a research project that was supported by a grant from the Research Center for the Humanities, Deanship of Scientific Research at King Saud University, 2019.

Copyrights