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Science and Mathematics Developed Curricula from Experts' Perspectives

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Abstract

This study investigated Collins' curriculum problems in the subjects of science and mathematics from experts' perspective in Jordan. There are some complaints from teachers in Jordan about Collins' mathematics curriculum which is taught for the first and fourth grades. Many teachers claimed it has not relied on any scientific studies that justified the preference of applying this curriculum over the former curriculum designed by Jordanian curricula experts. The study sample involved (55) experts from Directorates of Education and the Ministry of education Center. A questionnaire was designed to collect data about expert's views of Collins' curriculum and its problems. The results revealed that the level of problems came to a medium degree, and there were statistically significant differences at ($\alpha \leq 0.05$) in the problems that teachers face in applying Collins' curriculum according to the variable "years of experience" which was in favor of teachers with "experience less than one year". The study recommended to revise and develop science and mathematics Collins' curriculum to be consistent with the Jordanian society' norms and merge Collins' curriculum with the previous curriculum rather than completely canceling it.

Keywords: Amman Directorates of Education, Collins' curriculum, Curriculum problems, Jordanian school students.

1. Introduction

The educational process is a dynamic and evolving practice. Generally, countries seek to develop their curricula to effectively meet the great requirements of modern advances and achieve their nation's aspirations. Developed countries tend to address problems related to their curricula to solve them (Jawdah & Al-Aker, 2018). Regularly, the educational systems in Jordan attempt to stay abreast of educational developments, and cooperate with international organizations such as UNESCO and the U.S.A Agency for International Development to improve education. Remarkably, the recommendations of the Fourth National Conference for Educational Development (2017) indicated that executive proposals should be advanced to establish new strategies in developing countries' curricula and design schoolbooks built on the experiences of a number of developed and under-developing countries including the United States, Britain and Indonesia which have followed a cohesive project for preparing textbooks. The Jordanian National Center for Curriculum Development (2019) took over the errand of advancing the curricula. Consequently, it has developed the books of science and mathematics for the first grade and fourth grade in Jordan. The books have adopted Collins' curriculum as students have been taught within a plan that would build a strong scientific foundation within a comprehensive plan in the academic year 2019/2020.

Collins' curriculum was created by the American teacher Marva Collins who founded Westside Preparatory School in the USA in 1975 (Collins & Tamarkin, 1990). She had a vision that stresses that children do not fail, and her philosophy is that success can be achieved for

all (Collins & Tamarkin, 1990), and thus she has adopted the idea of providing high-quality books to students to encourage higher-level thinking in them (Lockhart, 2019). Collins' curriculum consists of many elements, and its development requires the development of many areas, such as the development of textbooks, teaching methods, the development of teachers' preparation, school buildings, laboratories and playgrounds, the contents of the curriculum and the development of methods of students' assessment, where the curriculum should have first been evaluated in terms of its elements and then it can be developed before it is used. After that, the curriculum should undergo another evaluation process. Oftentimes, curricula are a shared responsibility between a group of people, such as teachers, supervisors, principals, educational staff in the region and others (Arrieta, 2021).

Mathematics curricula and mathematics books are in themselves an educational experience for both the teacher and the student as they help in developing learners' mathematical thinking and logical reasoning which requires improving teaching methods to help students understand and remember (den Heuvel-Panhuizen et al., 2021) due to their reliance on abstract symbols including symbols, shapes and numbers as they are based on thinking skills, mental habits, practicing mental habits and solving problems. Mathematics curricula greatly affect the development of the learner's cognitive and mental abilities, which necessitates restructuring them in the light of life developments (Valverde et al, 2002). They are important subjects that students study because of their important role in many aspects of life in the future (Even, 2020) as understanding mathematics will allow the students to apply mathematical concepts and laws on the ground (Park & Leung, 2006). And that the development of mathematics curricula should be able to meet the requirements of the contemporary modern time and the individuals' needs (Zhu & Fan, 2006).

Likewise, researchers have focused on science curricula and methods of teaching different countries because of the challenges that have affected the educational process, such as the progress of scientific knowledge and its relationship to issues of the environment, society, technology and knowledge economy. As a result, educational systems have to respond to the different necessities of change and progress in curricula particularly science and mathematics curricula.

Remarkably, teaching methods have changed from concentrating on memorization to attaining knowledge and problem solving skills. The strategy of learning by playing and learning by discovery has been emphasized as one of the most prominent teaching methods suitable for learning science and mathematics as it needs an empirical and practical treatment to develop scientific concepts without feeling bored (Haeusler & Donovan, 2020). However, the process of curriculum development and its application is often encountered by various problems and difficulties as teachers may suffer from different problems in various fields. To make an actual development of the curricula, it is necessary to identify the weaknesses as well as strengths of the designed curricula and work hard to identify the possible challenges, problems and difficulties that may face the teaching of the curricula. This is often a first step to reform education in general (Al-Rashidi, 2011).

Collins' approaches in her philosophy follow Socrates' method which was customized and modified to be used in basic schools. It aims to select materials that have abstract content to challenge students' logic. This in turn clues to diverse meanings for each student in order to inspire him to discuss an idea. This is especially achieved while teaching children how to think after which the student starts to ask several questions linked to the topic beginning with reference to the title and probably moving to topics covered by the lessons. However, prospects should be founded on the use of reason, and evidence without fallacy to aid students construct a set of principles. According to Collin's approach, the teacher asks questions at arguments interrelated to the topic so that the students acquire how to check their reasoning and thinking. Students are asked to write an article about their investigative and critical opinions to learn how to go back to what has been acquired to support their opinions (Rule & Montgomery, 2011).

Northouse (2021) pointed out that the ability of Collins' curriculum to adapt its style to different situations was crucial to its success as it has taken the path of motivating students to perform and achieve at a higher level. In addition, its

genuine care for each learner has made its curriculum an example of model impact, inspirational motivation, intellectual stimulation and individual consideration. The use of critical thinking and problem-solving skills in Collins' curriculum has increased students' intellectual capacity and thus it has produced the academic success for which she has been known of (Northouse, 2021). In so doing, Collins' methodology insists on giving individual consideration to each student by encouraging each student to reach his goals.

In light of the process of developing mathematics curricula in Jordan, Collins' curriculum has been adopted to teach mathematics and science since 2019, despite of the strong opposition from teachers and parents who view that these books are not suitable for teaching in their current form or design because they do not fit the Jordanian social norms. In addition, the curriculum has not adhered to the philosophy and perspectives of education in Jordan. And there has been no national study or paper that recommended the replacement of the formerly used national curriculum which was just updated and revised before applying it four years ago.

The opponents of introducing Collins' curriculum considered that it has exceeded educational norms in Jordan as the Ministry of Education is normally responsible for preparing the curricula through its cadres of teachers. And the decision to teach the new curriculum (Collins' curriculum) is a hasty decision that has not relied on a scientific study that confirms the preference of this curriculum over the Jordanian former curriculum or any other curriculum that can be adopted. There have been protests and criticism campaigns on social media sites that called for the elimination of Collins' curriculum because of the exertion of teaching it. It has been claimed that it is more sophisticated than students' level which created anxiety among teachers and parents (Collins, 2017).

There were attempts by the Jordanian school teachers, and a group of parents, to communicate with the Jordanian National Center for Curriculum Development to make their comments and complaints about Collins' curriculum but they were to no avail. However, the Ministry of Education has recently undertaken to make some amendments to Collins' curriculum that go in line with the teachers' views (Sheikh, 2016).

1.1 Study Problem

Commonly, problems are defined as obstacles that prevent achieving the desired goals of teaching a curriculum whether these are related to behavioral goals, academic content, content teaching methods, educational activities or material capabilities (Hassan, 2012). The problems of newly developed curricula normally vary from problems related to the nature of education, the teacher, the nature of the school or the community (El-Khouli, 2011; Saada & Ibrahim, 2011). The process of preparing and developing curricula and textbooks is habitually a national participatory process the responsibility of which rests with all stakeholders. It is customary in Jordan to prepare and develop curricula by the Jordanian Ministry of Education, and for teachers to be an essential element in its development as they are the most closely related to students and they know the problems and difficulties of the curriculum and its need for possible development. Teachers are also aware of the students' mental abilities, levels, needs, tendencies and the sequence of their knowledge building as a result of their long experience and practice. Throughout the researcher' academic experience and his observations during his field visits to a number of primary schools, he perceived some objections from teachers about Collins' curriculum in mathematics and science.

1.2 Research Questions

The study aimed to answer the following two questions raised by the study:

1. What are the problems that teachers face in applying Collins' curriculum from the experts' viewpoint in Amman Directorates of Education and the Ministry of Education Center?
2. Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) in the estimates of experts in Amman Directorates of Education and the Ministry's Center for the problems that teachers face in applying Collins' curriculum due to differences in years of experience variable?

1.3 Objectives of the Study

The study aimed to

1. Investigate the problems that teachers face in applying Collins' curriculum from the experts' viewpoint in Amman Directorates of Education and the Ministry's Center.
2. Identify the differences in the estimates of experts in Amman Directorates of Education and the Ministry's Center of the problems faced by teachers in applying Collins' curriculum according to the "years of experience" variable.

1.4 Importance of the Study

The importance of the current study lies in its shedding light on protuberant problems in Collins' curricula in order to attain educational development that are compatible with the Jordanian general philosophy as well as objectives of education, and in a manner that is essentially goes in line with the students' interest. Besides, it aims to provide students with all means of success by employing contemporary skills, such as critical thinking, enquiry, cooperation, assessment, scrutiny and substantiation based on up-to-the-minute strategies and approaches of learning, prime use of what the learning atmosphere provides which is in connection to the learner's life, personality and Jordanian background.

This study contributes to adding data to the Arabic works about Collins' curriculum. It is one of the rare studies that discussed Collins' methods and problems in the Arab world. It also seeks to give those who are interested and specialists in the subject essential information to improve the developed curricula (Collins' curriculum), which would contribute to educational reform.

1.5 Definition of Terms

(i) *Collins' Curriculum (in Jordan):* They are textbooks approved by the National Center for Curriculum Development in the Hashemite Kingdom of Jordan to teach science and mathematics curricula for the 1st and 4th grades students.
(ii) *Curriculum problems:* They are the difficulties encountered from mathematics and science teachers' views for the 1st and 4th grades when teaching the developed curriculum (Collins' curriculum). They have been determined by the answers of experts on the scale of the problems faced by teachers in applying Collins' curriculum.

1.6 The limits of the Study

The current study was limited to:

(i) *Spatial boundaries*: the study was limited to Amman Directorates of Education and the Ministry's Center.
(ii) *Time limits:* The study was implemented in 2020/2021 academic year.
(iii) *Human limits*: The study sample was limited to a sample of experts in Amman Directorates of Education and the Jordanian Ministry of Education's Center
(iv) *Objective limits*: The study was limited to addressing the issue of problems faced by teachers in applying Collins' curriculum from the experts' views in Amman Directorates of Education and the Ministry's Center.

2. Literature Review

Herold's (2020) study aimed to investigate how physical education (PE) teachers understand and use the new and traditional national curriculum for physical education (NCPE) in England. The sample comprised of (43) teachers. They were interviewed through semi-structured interviews. The results of the study showed that the curriculum document nature has provided teachers with limited guidelines for teaching and assessment was simple, but it was considered editorial by some. It suggested removing of specific assessment guidelines to allow freedom, but opportunities to implement innovative assessment approaches were not seized. And it is unlikely that the recent curricular reform will have a substantial effect on teaching in England.

Al-Tai's (2019) study aimed at identifying the undesirable effects of changing mathematics curriculum for the basic stage from mathematics teachers point of view in Iraq. The sample of the study consisted of (50) female mathematics teachers in the center of Babel Province. It was chosen randomly. The researcher used a questionnaire to collect data and the descriptive survey method to analyze the data. The results showed that there was a group of undesirable effects for changing the curriculum of mathematics related to the content. The study recommended to reconsider the primary school mathematics curriculum by the Iraqi curriculum authors and to take the mathematics teachers' opinions to improve the curriculum content.

Butt and Shahzad (2019) examined the extent to which English language teachers in secondary

schools in Punjab Province in Pakistan participate in the process of changing the national curricula. Individual interviews were conducted with English teachers in four high schools. The results showed that teachers were rarely referred to during designing phase of curriculum change, and there was no official support for teachers at the region or school level preparing them to implement the changed curriculum. The study recommended that teachers should participate in designing curricula and they should be developed professionally to implement changed curricula efficiently and competently.

Al-Lazam (2019) investigated the teaching problems facing teachers of developed science curricula at the intermediate stage in Riyadh, Saudi Arabia. The study used the descriptive approach. The study sample consisted of (152) teachers. A questionnaire was used as a tool for data collection. Among the most prominent findings of the study are the following: student-related problems which were ranked first with a high degree. Problems related to science laboratories were categorized with a high degree. Whereas content-related problems were ranked with a medium rank. The average of the problems in total was with a medium degree. The study showed that there were no statistically significant differences between the averages of all problems because of the specialization variable, excluding problems related to the teacher, student and evaluation where there were some differences in favor of teachers of biology.

With regards to the variable "educational qualification", there were no differences excluding problems associated with learning resources, activities and assessment which were in favor of the holders of educational qualification. The variable of 'qualification type' showed that there were no differences but for problems associated with the teacher which were in favor of the holders of a master's degree. The results showed no differences in the "experience" variable apart from problems associated with the teacher, educational goals, and content which were in favor of the variable "number of years of experience". Regarding the training courses variable, there were no differences but for problems associated with the teacher and evaluation which were in favor of those who have received training courses in the developed curricula of science.

Al-Shammari and Al-Dawish (2017) investigated problems of teaching mathematics at the primary stage in Hail schools in Saudi Arabia. The sample of the study consisted of (102) primary school mathematics teachers and (11) mathematics educational supervisors. The researchers used a questionnaire to collect data. It involved five axes: course related problems, students related problems, problems associated with the teachers of mathematics, problems associated with the mathematics supervisor and problems associated with school administration. The results of the study revealed the inadequacy of the general objectives for the age of the students and the absence of statistically significant differences towards all the problems related to teaching mathematics course in the primary stage according to the variable "classes taught by teachers". It was also found that there were statistically significant differences between the study sample members of primary school teachers towards all problems related to teaching mathematics course in the primary stage in remote schools in the Hail Region in favor of the study sample members of mathematics teachers in primary schools. Additionally, it was found that there were no statistically significant differences between the primary school teachers towards all problems associated with teaching mathematics course.

Muhammad (2015) studied the kindergarten teachers' attitudes towards the curriculum "I have the right to play, learn and innovate" in Fayoum Governorate-Egypt, as well as identifying the role of the following variables: educational qualification, experience, training courses in Egypt. The sample which consisted of (350) teachers was randomly selected. A questionnaire was designed to collect data. The results of the study revealed that there were high positive attitudes towards the new curriculum in general.

Al-Sheikh (2016) investigated the problems in teaching the prime science curriculum (McGraw-Hill series) as perceived by supervisors and teachers in Saudi Arabia. A descriptive approach was used. The sample of the study included (7) supervisors and (81) teachers. The results revealed tht at there were statistically significant differences between the supervisors' responses and the teachers' responses. On one hand, the supervisors agree that the science teaching approach was a big

problem in which teachers came at the top of the list, followed by teaching methods, aids and the school administration at the bottom of the list. However, teachers' responses displayed that the level of problems they face when teaching science was average.

To sum up, previous studies have dealt with the curriculum and the problems facing its teaching. They examined science curricula (e.g., Al-Lazam, 2019; Al-Sheikh, 2016), mathematics curricula (Al-Shammari & Al-Dawish, 2017), physical education curricula (Herold, 2020), and kindergarten curricula (Mohammed, 2015). As for the current study, it dealt with Collins' curriculum for mathematics and science that are taught in Jordan for the first and fourth grades. It aimed to reveal the problems faced by teachers in applying Collins' curriculum from the point of view of experts in Amman Directorates of Education and the Ministry's Center

3. Methods

In his study, the researchers used the analytical method to answer the two questions of the study, due to its suitability to the nature of the study to achieve its objectives.

3.1 Population and Sample of the Study

The study community consisted of curricula experts in Amman Directorates of Education and the Ministry's Center whose number is (92) experts. They had previously participated in the process of developing Jordanian curricula. The sample of the study consisted of (55) experts from Amman Education Directorates and the Ministry's Center who were chosen randomly method and made (60%) of the study population. A questionnaire was distributed to them electronically due to the current health conditions represented by Corona pandemic (COVID-19). Table (1) displays the distribution of the sample of the study according to the "years of experience" variable.

TABLE 1. Sample members according to "number of years of experience" variable

Variable	Category	Frequency	Percentage %
Years of Experience	less than 5 years	8	14.5
	From 5-10 years	29	52.7
	11-15 years old	14	25.5
	16 years and over	4	7.3
	Total	55	100.0%

Table 1 displays the distribution of the members of the study according to the "number of years" experience variable where the highest frequency was for the experience category "from 5-10 years" by (29) and with a percentage (52.7%). While the frequency for the experience category "from 11-15 years" was (14) and with a percentage (25.5%). The frequency for the experience category "less than 5 years" was (8) and by a percentage (14.5%). And the repetition rate for the experience category was "16 years and over" (4) and by a percentage (7.3%).

3.2 Study Tool

A questionnaire was built to collect data from the members of the study sample through adopting previous studies models (e.g., Al-Shammari & Al-Dawish, 2017; Al-Sheikh, 2016; Al-Tai, 2019). The questionnaire contained personal details of the study sample members (gender and years of experience). And it also included (20) items measuring the problems that teachers face in applying Collins' curriculum.

3.3 The Validity of the Study Tool

3.3.1 Content Validity

The content validity of the questionnaire was checked by presenting it to (8) reviewers who are expert in teaching curricula. They expressed their opinions about the integrity of the linguistic

formulation of the items, the clarity of terms, and their measurement of the aim they were set for. The reviewers' comments and suggestions were taken and the items were modified relying on the consensus of the majority of reviewers.

3.3.2 Structural Validity

To calculate the structural validity of the questionnaire, it was applied to a pilot study involving (25) experts who were selected from outside the study original sample. The correlation coefficients were calculated between each of the items of the scale with the scale as a whole as shown in Table 2.

Table 2. Correlation coefficients between each item with the scale as a whole

No.	Correlation with the scale	No.	Correlation with the scale	No.	Correlation with the scale
1	0.72**	8	0.77**	15	0.67**
2	0.67**	9	0.69**	16	0.56**
3	0.71**	10	0.58**	17	0.60**
4	0.70**	11	0.65**	18	0.62**
5	0.58**	12	0.82**	19	0.60**
6	0.62**	13	0.68**	20	0.64**
7	0.70**	14	0.52**	-	-

* Correlation coefficients of a function at the significance level ($\alpha \leq 0.05$)

** Correlation coefficients of a function at the level of significance ($\alpha \leq 0.01$)

Table 2 showed that the correlation coefficients between each item and the scale as a whole ranged between (0.52-0.82). This is considered acceptable correlation coefficients for the purposes of applying this study.

3.3.3 Stability of the Study Tool

In order to ensure the stability indicators of the study tool, it was piloted on a sample consisting of (25) experts from out the real sample. Cronbach Alpha equation was calculated for the study tool in order to calculate the internal consistency coefficient. The results showed that the reliability coefficient of Cronbach's alpha method for the scale "problems faced by teachers in applying Collins' curriculum" was (0.84), and this value indicated an acceptable degree for the purpose of conducting the study.

3.3.4 Correction of the Study Tool

The tool of the study included a questionnaire consisting of "Problems faced by teachers' scale in applying Collins' curriculum" which consisted of (20) items. The researcher used Likert scale of five-gradient to measure the members' opinions. The responses of the study sample were distributed as follows: to very high extent (5), to a great extent (4), to a moderate extent (3), to a small extent (2) and to a very small extent (1) by ticking (√) next to the answer that reflects their degree of agreement. This classification was relied upon to calculate the means in which the degree of approval was calculated using the following equation:

$$\frac{\text{The upper end of the scale (5) - the lower end of the scale (1)}}{\text{Number of levels required (3)}}$$

$= (5-1)/3 = 1.33$

After that the answer (1.33) was added to the end of each category so that the levels of approval become as follows:

- From 1.00-2.33 low
- From 2.34- 3.67 Intermediate
- From 3.68- 5.00 high

3.4 Study Variables

The study included two variables:

a) The independent variable: "years of experience", has four categories: (less than 5 years, 5-10, 11-15, and 16 years and over).
b) The dependent variable: Collins' curriculum problems scale from the point of view of experts, and it has (20) items.

4. Results and Discussion

This section presents the findings and discusses the results of the study, which aimed to identify the problems that teachers face in applying Collins' curriculum from the experts' point of view in Amman Directorates of Education and the Ministry's Center, which are presented according to the questions of the study.

RQ 1. "What are the problems that teachers face in applying Collins' curriculum from the point of view of experts in Amman Directorates of Education and the Ministry's Center?"

To answer this question, the means and standard deviations of all the items of Collins' curriculum problems from the experts' point of view were calculated as illustrated in Table 3.

Table 3. Collins' curriculum problems from the experts' view and the scale as a whole.

Rank	No.	Item	SMA	SD	Degree
1	7	Collins' curriculum contains information that is of little importance to the student and it is not appropriate for the age group.	4.42	0.71	High
2	5	Collins' curriculum takes into account the individual differences among students.	4.22	0.63	High
3	4	Collins' curriculum contains pedagogical objectives that indicate clear learning outcomes that lead to better learner goals.	4.00	0.54	High
4	3	There is no correlation between the educational objectives of Collins' curriculum and community issues and problems.	3.82	0.51	High
5	6	Collins' curriculum includes terms that are alien to the students.	3.73	1.30	High
6	11	Collins' curriculum causes most students to feel frustrated and alienates them from education because it is difficult and does not match the students' levels.	3.47	0.92	medium
7	2	The goals of Collins' curriculum are unattainable.	3.58	0.57	medium
8	1	Collins' curriculum is based on memorization, where students are exposed to arithmetic problems without understanding them.	3.58	0.66	medium
9	20	Collins' curriculum does not fit with the Arab culture.	3.33	0.72	medium
10	17	Collins curriculum is established to teach the students to read from left to right, as opposed to Arabic writing system.	3.29	0.92	medium
11	18	Collins' curriculum includes Arabic numerals, which causes students to get confused between what they are learning in science and mathematics and the rest of the books that contain Indian numerals.	3.29	0.90	medium
12	13	Collins' curriculum does not include learning outcomes or objectives to be achieved after units or lessons taught before each lesson and unit.	3.27	0.80	medium

13	19	Collins' curriculum leaves parents feeling overwhelmed and powerless to help their children learn and the family needs to spend a lot of time with them studying, doing homework and working papers.	3.24	0.90	medium
14	16	Collins' curriculum includes bringing supplies that are difficult to provide for most Jordanian students and do not reflect the Jordanian environment, such as "pasting a picture of one's family members to show genetic traits."	3.13	1.09	medium
15	12	Collins' curriculum has been translated into poor language and format.	3.11	0.92	medium
16	8	The level of higher mental processes in Collins' curriculum is too high and not appropriate for the students' age group.	3.09	1.32	medium
17	9	The topics of the books are difficult for the teacher, which made many teachers change the order of the units in the book.	3.05	1.24	medium
18	10	The topics of the books are difficult and the teacher feels helpless due to the low rates of students' comprehension, understanding and proficiency compared to the previous curricula.	2.98	1.01	medium
19	14	Collins' curriculum contains many formal errors, such as the small font of the book, which is not suitable for the students' age.	2.91	0.93	medium
20	15	Collins' curriculum poses unknown and ambiguous questions to the students and their parents.	2.87	0.94	medium
		The scale of problems with Collins' curriculum as a whole	3.42	0.39	medium

Table 3 displays that the mean of the items of the scale of problems faced by teachers in applying Collins' curriculum experts' point of view ranged between (4.42-2.87) and they were of high and medium degrees, where the highest was for the item (7) which states "Collins' curriculum contains information that is of little importance to the students and is not appropriate for the students' age group" with an arithmetic average of (4.42) and a high degree. While item (5) which states "Collins' curriculum takes into account individual differences among students" came in the second place, with an average of (4.22) and at a high degree. Whereas item (15) which states "Collins' curriculum asks unknown and ambiguous questions to the students and the parents" came in the last rank, with a mean of (2.87) and at an average degree. The mean of the problems faced by teachers in applying Collins' curriculum from the point of view of experts in Amman Directorates of Education and the Ministry's Center was (3.42), to a medium degree.

These results may be attributed to the fact that the British Collins' curriculum did not conform to the customs and traditions of the Jordanian society due to its use of new terms to students which takes more time than usual to explain the lessons. Obviously, this overburdens the teachers' load and increases the burden of their teaching process, given that the curriculum is not consistent with the nature, environment and upbringing of the Jordanian students.

This result agreed with the findings of Herold's (2020) study which revealed the existence of a group of undesirable impacts for altering the mathematics curriculum. In addition, it agreed

with Al-Shammari and Al-Dawish's (2017) findings which revealed the inadequacy of the mathematics course general objectives due to the age of students. Also, it agreed with the Al-Sheikh's (2016) findings that revealed that supervisors agree that the science curriculum is a major problem, with worries concerning teachers came out on top. Then teaching methods, laboratories, evaluation and school management came last. While the result of the present study differed Muhammad's (2015) results which found high encouraging tendencies and attitudes towards the new curriculum.

RQ 2. "Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) in the estimates of experts in Amman Directorates of Education and the Ministry's Center of the problems that teachers face in applying Collins' curriculum due to the variable years of experience?

To answer this question, a binary analysis of variance (ANOVA) test was applied to identify the differences in experts' estimates regarding the problems that teachers face in applying Collins' curriculum due to "years of experience" variable.

Table 4. Experts' estimates of the problems faced by teachers in applying Collins' curriculum according to "years of experience" variable

Category	SMA	St. Dev.
Less than 5 years	3.53	0.36
From 5-10 years	3.52	0.38
11-15 years old	3.20	0.36
16 years and over	3.21	0.25

Table 4 displays that there were obvious differences between the means according to the different variables of gender and years of experience. The two-way analysis of variance (2-Way ANOVA) was applied on the two study scales as illustrated in Table 5 in order to reveal the statistical significance of these differences.

Table 5. Differences in the problems of Collins' curriculum according to the variable years of experience.

Variable	**Sum of Squares**	**Variable**	**Sum of Squares**	**Variable**	**Sum of Squares**
Years of Experience	1.221	3	.4070	3.010	.0390
The error	6.896	51	.1350		
corrected total	8.117	54			

Table 5 shows that there were statistically significant differences at ($\alpha \leq 0.05$) in the experts' estimates of problems of Collins' curriculum due to the variable years of experience where the value of P was (3.010) and the statistical significance was (0.039) while Scheffe's test was applied for dimensional comparisons as shown in Table (6).

Table 6. Results of the application of the Scheffe's test for dimensional comparisons

Variable	**Category**	**SMA**	**Less than 5**	**From 5-10**	**From 11-15**	**16 and over**
Years of Experience	less than 5 years		-	0.01	0.33	0.32

From 5-10 years	3.53	-	-	0.32	0.31
11-15 years old	3.52	-	-	-	-0.01
16 years and over	3.20	-	-	-	-

It is evident from Table 6 that the differences in the experts' estimates in Amman Education Directorates and the Ministry's Center of the problems faced by teachers in applying Collins' curriculum due to "years of experience" variable which were between "less than 5 years" category "from 11-15 years" category and "16 years and over" experience category. And the differences for the experience category were "less than 5 years" with an arithmetic average of (3.53) at a medium degree. While the arithmetic average for the experience category "from 11-15 years" was (3.20), at a medium degree. And the arithmetic average of the experience category "16 years and over" was with moderate degree at (3.21). This result may be due to the fact that teachers who do not have sufficient teaching experience find it more difficult than teachers with extensive teaching experience. Teachers who are newly hired and have little experience and involvement in the teaching environment do not have previous experience of how to teach educational materials such as Collins' curriculum. Whereas the low-experienced teachers find it difficult to explain the educational materials in the light of this curriculum because translation that did not take Arabization of the key words into account, and the failure to take into account the suitability of the curriculum to the actual level of the students. This result agreed with Al-Lazam's (2019) findings which showed that there were statistically significant differences for the problems facing teachers in the educational objectives of the developed science curricula, and the content due to "years of experience" variable.

5. Recommendations

In light of the findings of the study, the study recommends to:

(i) Revise and develop Collins' curriculum in mathematics to go with the norms of Jordanian society, and to integrate it with the previous subjects rather than cancelling it.

(ii) Give teachers the opportunity to be involved in the proposals of curriculum development, and consider their views.

(iii) Conduct studies like to the present one but in different schools across the Jordan taking into account other variables such as: teachers' ages, grade, and educational qualifications.

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