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Evaluation of the 10th Grade Computerized Mathematics Curriculum from the Perspective of the Teachers and Educational Supervisors in the Southern Region in Jordan

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Abstract
This study aimed at evaluating the 10th grade computerized mathematics curriculum from the perspective of the teachers and supervisors in the southern region in Jordan. The study population consisted of all the teachers who teach the 10th grade in the southern region, with the total of (309) teachers and (20) supervisors. The sample consisted of (288) teachers and (15) supervisors. A questionnaire of (43) items was prepared, it was verified for validity and reliability. Results showed statistically significant differences ($\propto = 0.05$) between the evaluating estimations of the teachers and supervisors for the computerized mathematics curriculum in favor of the supervisors.
Keywords: computerized mathematics curriculum, evaluations, 10th grade, southern region, teacher, supervisor.

Introduction

School textbooks represent the executive vision of the content that teachers depend on in planning, implementing and evaluating their lessons. The textbook clarifies the educational goals that the educational institutions aim to achieve. It also displays the educational material in a clear way and it provides teachers with the questions that can be asked to be answered by students; moreover, it provides them with ideas and activities.

The last decade witnessed an expansion in computer applications; then the concept of electronic learning, that depends on electronic technology in presenting the educational content in an interesting and effective way, appeared. Electronic learning is defined as a broad concept that implies a wide field of educational materials that can be presented by compact disks or through the local area net (LAN) or the internet, and it includes the training that is based on computer, the training that is based on the web, remote learning and direct web learning. It is also defined as the content that is used in designing activities and educational materials that depend on computer and to suit the computerized school, it should be spread through the internet, and it can be available through being uploaded on the internet or received from the publisher through the computerized mail (Al- Tudari, 2004).

Electronic learning is considered one of the most important modern technological ways in the processes of learning and teaching since it helps in solving the problem of knowledge explosion and the increasing demand on learning. It also helps in meeting the needs f the individual learners in which the student learns according to his/her own speed; in addition to improving information storage, accessing to this information in the suitable time, and unifying the content for all the learners (Al- Abadi, 2002).

The mathematics curriculum in the Jordanian educational initiative depends on analyzing the mathematical sciences' criteria that is presented from specialized committees, numerical sciences' criteria in the united kingdom, and the criteria and principles of mathematics in the American National Council. The mathematics curriculum in the Jordanian educational initiative reflects the best ideas internationally standardized. It consists of six fields: numerical knowledge, algebra, engineering, data analysis, logic and calculations. These fields include the basic concepts in mathematics from kindergarten to the twelfth grade. These concepts were arranged hierarchically and successively where they agree with the international fields for teaching mathematics. The importance of using the internet in developing the students' skills and helping them in doing their homework appears in that it widens the students' imagination, increases their knowledge and explores their abilities in dealing with the worldwide web (Ministry of education, 2004).

Problem and Questions of the Study

The ministry of education has computerized the school curricula, especially the mathematics curriculum, by local and foreign companies; and it spent a lot of money, but does it succeed in presenting curricula that deserve the effort, time and expenses that was given?. This inquiry needs an analysis of these curricula and defining the points of strength and weakness in them. Since it is important to develop curricula in general, and mathematics curriculum in specific, and because of the importance of the teacher's and the supervisor's role in evaluating these curricula, this study was conducted in which the 10th grade computerized mathematics curriculum is

evaluated from the perspective of mathematics' teachers and educational supervisors in the southern region of Jordan; and specifically, this study attempts to answer the following questions:

The first question: What are the evaluating estimations of the mathematics' teachers and supervisors in the southern region for the 10th grade computerized mathematics curriculum?

The second question: Are there any statistically significant differences at the level ($\propto = 0.05$) between the teachers' and supervisors' evaluations for the computerized mathematics curriculum for the basic 10th grade in the southern region?

The Significance of the Study

The significance of the study emerges from the assumption that it may offer assistance to those in charge in the ministry of education in Jordan, in that is shows the points of weakness and strength in the 10th grade computerized mathematics curriculum. It also presents a new addition to the Arabic studies in this field in order to bridge the gap that Arabic libraries suffer from. Moreover, it paves the way to other researches that are derived from the topic of this study in order to cover other areas in the computerized curricula.

Operational Definitions

Computerized mathematics curriculum: It is an educational material that has been computerized by experts under the supervision of the ministry of education in Jordan; it then has been inserted in the computerized learning system (Eduwave) for the M.O.E on the internet in which the computerized curriculum displays the material and explains it to the students; in addition to exercises and different activities.

Evaluating estimations of the teachers and supervisors: It is the mean of the evaluations of the study sample (teachers and supervisors) of the 10th grade computerized mathematics curriculum in light of their responses to the items of the study tool.

Tenth grade: It is an educational level that represents the last grade in the basic stage Jordan; the students' age in this grade is about 16 years old.

The southern region: It is the geographic region that includes the provinces of Karak, Tafila, Ma'an and Aqaba in Jordan and it includes (11) educational directorates.

The teacher: Who teaches the 10th grade mathematics material in the schools that belong to the educational directorates.

The supervisor: Who supervises the mathematics' teachers who are appointed by the M.O.E in Jordan, especially in the directorates that represent the population of the study.

Limitations of the Study

- The basic 10th grade computerized mathematics curriculum which is taught by a decree of the education council number (28/2005).
- The male and female teachers who teach mathematics for the 10th grade in the schools that belong to the educational directorates in the southern region in Jordan in the academic year 2014/2015.

Related Previous Studies

After referring to Arabic and foreign educational researches, a set of related studies was collected and ordered chronologically from the oldest to the most recent.

Joffe (2000) conducted a study that aimed at investigating learning by the internet and its effect on the students' achievement in college in the course of calculations. The study sample consisted of (46) female and male students in Colorado university in America. They were distributed into two groups: experimental that was taught by the internet, and control that was taught traditionally. The findings of the study showed that there were statistically significant differences at the level ($\propto = 0.05$) between the two groups in their achievement in favor of the experimental group.

Al-Sharari (2001) conducted a study to evaluate the intermediate 1st class mathematics textbook in Saudi Arabia from the perspective of the teachers . A tool that was developed by the researches was used; it was distributed into four fields: content, activities, evaluation and the overall shape and layout the book. The study sample consisted of (74) teachers from Al-Jouf region. The findings showed that the evaluation of the book in general was positive in that (59%) of the tool items were in a high level, (38%) were in a medium level, and (3%) were in a low level. Furthermore, the evaluations of the teachers with (10 or more) experience years were higher in statistically significant differences than those of teachers with less experience (5 or less years).

Subaih (2004) content – analyzed and evaluated the mathematics books in Jordan in light of the content standards and operations issued by the American National Council. The study sample consisted of the mathematics books from the seventh to the tenth grades. The findings showed that the congruence between the content and the standards ranged between high in some cases and medium and low in most cases.

Al-Omari (2010) investigated the effect of using the computerized mathematics curriculum in learning

mathematical concepts curriculum in learning mathematical concepts. The study sample consisted of (62) students divided into two groups; (29) of them studied by using the unsynchronized learning style by the internet, and (33) students learned traditionally. The findings showed that the students who used the computerized mathematics curriculum enjoyed a higher degree of understanding the concept of learning computerization and their technical practices of it in teaching.

It is noticed that in these studies the computerized educational programs, that were used, were prepared by teachers themselves or trade programs; this study evaluates the 10th grade computerized mathematics curriculum which was developed by the ministry of education in the Hashemite Kingdom of Jordan.

The Population and the Sample of the Study

The population of the study consisted of all the teachers who teach the basic 10th grade in the educational directorates in the southern region in Jordan; (309) male and female teachers. Also, it included all the mathematics supervisors, (20) male and female supervisors in the southern region, according to the census of the M.O.E in the year (2014/2015). Table (1) shows the distribution of the study population subjects.

Table 1: The distribution of the study population according to the educational directorates.

Province	Directorate	Number of teachers	Number of supervisors
Karak	Karak	42	3
	Southern Mazar	31	3
	Al-Qasr	21	2
	Aghwar	22	1
Tafela	Tafela	47	2
	Ma'an	27	2
	Shoubak	10	1
	Petra	19	1
	Southern Badia	28	1
Aqaba	Aqaba	47	2
Total	Total	309	20

The study sample is the same as the population after removing the reliability sample which consisted of (25) teachers and supervisors; one questionnaire was cancelled because of inappropriateness for analysis. Thus the number of questionnaires for analysis was (303): (288) for teachers and (15) for supervisors.

The Study Tool

To achieve the purpose of the study, a tool for measuring the evaluations of the study sample for the computerized mathematics curriculum was developed by following the steps below:

1. Referring to the previous theoretical literature and studies that are related to the present study (Bani doumi, 2005; Al-Harbi, 2007; Subaih, 2004; Al-Inizi, 2010; Al-Mousa, 2005); these studies are ideas searched in the field of curricula evaluation and computerized educational programs.
2. Formulating (50) items that follow the five-scale Likert model divided into (5) fields for evaluating the 10th grade computerized mathematics curriculum from the perspective of the mathematics' teachers and supervisors in the southern region.
3. The tool was validated through:
    a) Content validity: The tool was initially shown to (10) experts in the field of curricula. Those were instructors in Mu'ta university who are specialized in mathematics and education technology; in addition to teachers and supervisors of mathematics. Each expert was asked to express his opinion about the study tool items in terms of language accuracy, items clarity, appropriateness to what it was designed to measure, and also suggesting any modifications on the items. In light of the experts' notes, the items that were totally agreed upon were not changed while some items were deleted or modified. The final version of the questionnaire consisted of (43) items.
    b) Internal congruence: Relation coefficient was estimated between the performances of the reliability sample subjects on each item and the field to which it belongs. Table (2) shows the values of relation coefficients.

Table (2): Relation coefficient between item score and the score of the field to which it belongs.

Item number	Relation coefficient	Item number	Relation coefficient	Item number	Relation coefficient	Item number	Relation coefficient
1.	0.49**	12	0.54**	23	0.54**	34	0.59**
2.	0.52**	13	0.40**	24	0.49**	35	0. 58**
3.	0.56**	14	0.50**	25	0.39**	36	0.63**
4.	0.52**	15	0.32**	26	0.51**	37	0.60**
5.	0.45**	16	0.59**	27	0.59**	38	0.62**
6.	0.44**	17	0.60**	28	0.66**	39	0.64**
7.	0.45**	18	0.65**	29	0.58**	40	0.39**
8.	0.65**	19	0.46**	30	0.46**	41	0.57**
9.	0.48**	20	0.43**	31	0.56**	42	0.61**
10.	0.61**	21	0.32**	32	0.61**	43	0.57**
11.	0.58**	22	0.65**	33	0.39**		

**** Significant value at level ($\propto$ = 0.01)**

Table (2) shows that all the relation coefficients were significant at level ($\propto$ = 0.01) and this indicates that what the item measures is also measured by the field to which it belongs.

4. Tool reliability was verified through applying it to a sample of (25) male and female teachers and supervisors from the study population. The tool reliability was verified through using Cronbach's Alpha equation, and it was applied another time after three weeks.

Then reliability coefficient was estimated by repetition. Table (3) shows the values of reliability coefficient for each field and for the tool in total.

Table (3): Values of reliability coefficients for each field and for the tool in total.

Field	Cronbach's Alpha equation	Repetition method
Layout and general information of curriculum.	0.80	0.79
Curriculum content and its organization.	0.76	0.80
Interaction with the curriculum and its tools.	0.85	0.84
Easiness of usage.	0.84	0.81
Evaluation.	0.81	0.77
Total	0.90	0.84

Table (3) shows that the values of reliability coefficients are acceptable for this type of studies.

Tool Correction

The tool in its final version consisted of (43) items, in front of each is a scale graded with five degrees according to Likert scale. It reflects the degree of the teacher and supervisor agreement on the item.

The degree of (very strongly agree) was given 5 grades; (strongly agree) was given 4 grades; (fairly agree) was given 3 grades; (weakly agree) was given 2 grades and (very weakly agree) was given 1 grade.

The following standard was used in judging the degree of standard availability after taking into consideration the opinion of the experts in measurement and evaluation.

- If the evaluation of the item equals or is less than 2.33, the degree is low.
- If the evaluation of the item equals or more than 2.33 and less than 3.66, the degree is medium.
- If the evaluation of the item equals or more than 3.67, the degree is high.

This is by dividing the distance between (1) which is the lowest grade and (5) which is the highest grade into three equal distances (low, medium, high).

Variables of the Study

- Independent variable: career level (supervisor, teacher).
- Dependent variable: the evaluations of the teachers and supervisors for the basic 10^{th} grade computerized mathematics curriculum.

Results

Results related to the first question: what are the evaluating estimations of the mathematics teachers and supervisors in the southern region for the basic 10^{th} grade computerized mathematics curriculum?

To answer this question, means and standard deviations for each item and each field of the study sample subjects' evaluations were estimated. Tables (4, 5, 6, 7, 8) show these findings as follows:

First: the field of layout and general information of the curriculum.

Table (4): The means and standard deviations of the sample's evaluation of the field of layout and general information.

Item number	Item text	Mean	Standard deviation	Evaluation
8	The curriculum includes references.	4.42	0.97	High
1	The curriculum includes an index of the subjects.	4.37	0.58	High
9	Geometric shapes and symbols are clear.	4.14	0.74	High
7	The main an secondary titles remarkably appear.	4.12	0.75	High
10	Rules, generalizations and theories appear in a colored and distinguished type.	3.89	1.03	High
11	The colors used in the curriculum are suitable and attractive.	3.69	0.90	High
2	It provides students with guidance and necessary instructions to interact with the curriculum.	3.49	0.80	Medium
5	The curriculum includes in the beginning of each lesson a list of objectives to be achieved.	3.48	1.07	Medium
6	The curriculum has no spelling mistakes.	3.43	0.83	Medium
4	The curriculum includes information that shows the requirements of its study.	3.28	0.85	Medium
3	It provides the students with a general plan in studying each subject.	3.14	0.86	Medium
Total		**3.77**	**0.54**	**High**

Table (4) shows that the evaluation for the items (2, 3, 4, 5, 6) were medium, and those of the other items were high; the lowest degree was for the item (it provides the students with a general plan in studying each subject) with a mean of (3.14). This might be due to the fact that the electronic curriculum is designed on the basis of knowledge economy; and it was designed to achieve self learning. The highest degree was for the item (the curriculum includes references) with a mean of (4.42) which is a high degree. This might be due to the importance of referring to different sources by teachers and supervisors in order to develop the skill of investigating various references in order to gain more benefits. Students will realize the importance of referring to many sources when searching any topic with details; and teachers will realize the importance of referring to sources when designing or preparing any curriculum. The total evaluation of layout and general information was high with a mean of (3.77); this might be due to the huge potentials that are offered by computer technology.

Second: The field of curriculum content and its organization.

Table (5): Means and standard deviations of the sample's evaluations for the field of curriculum content and its organization.

Item number	Item text	Mean	Standard deviation	Evaluation
13	The content reflects the educational objectives to be achieved.	3.75	0/78	High
18	The content includes various exercises for each subject.	3.62	0.86	Medium
12	The content is congruent with the general goals for the basic stage curricula.	3.42	0.88	Medium
17	the content includes enough examples on each subject.	3.42	0.84	Medium
16	The content is displayed in an exciting and attractive way.	3.31	0.91	Medium
14	The content of the curriculum is suitable to the level of the 10^{th} grade students.	3.28	0.94	Medium
15	The content contributes to the development of critical thinking skills of students.	3.28	0.84	Medium
20	The content develops the individual learning skill.	3.18	0.87	Medium
19	The content includes intensive activities for weak students.	2.90	1.02	Medium
Total		**3.35**	**0.65**	**Medium**

Table (5) shows that the evaluation for the item (the content reflects the educational objectives to be achieved) obtained the highest degree with the mean (3.75), which is high; this might be due to the attention that the teachers and supervisors pay to the educational objectives and their commitment to achieve this objectives in the learning – teaching process. The rest of the items' evaluations were medium and the lowest degree was for the item (the content includes intensive activities for weak students) with a mean of (2.90); this might be attributed to the extra care of the content designers through increasing the number of examples and exercises at

the expense of the educational activities. The total evaluation of the field of content of the curriculum and its organization was medium with a mean of (3.35); this might be due to the effort made by the M.O.E in constructing this curriculum.

Third: The field of interaction with the elements of the curriculum and its tools.

Table (6): The means and standard deviations of the sample's evaluations for the field of interaction with the curriculum and its tools.

Item number	Item text	Mean	Standard deviation	Evaluation
21	The computerized program tools are related to the educational goals mentioned in the curriculum.	3.54	0.75	Medium
23	The computerized curriculum offers an interactive set of drawings.	3.46	0.80	Medium
22	The tools presented are suitable to the age of the students.	3.38	0.85	Medium
28	The included diverse relations are characterized by effectiveness.	3.27	1.03	Medium
24	The curriculum presents chances and for the student to interact with the content.	3.25	0.85	Medium
26	The curriculum offers tool for unsynchronized interaction between students among each other, and with teachers.	3.06	0.95	Medium
25	The curriculum offers tools that allow synchronized interaction between students.	3.04	0.91	Medium
27	The subjects of the curriculum are related to sites on the internet.	3.03	1.10	Medium
Total		**3.25**	**0.63**	**Medium**

Table (6) shows that the evaluation of all the items were medium; the lowest evaluation degree was for the item (the subjects of the curriculum are related to sites on the internet) with a mean of (3.03) and this might be due to the interest of the curriculum executives in the information which it contains more than offering enhancing sites that deal with the subject with more details. The highest degree of evaluation was for the item (the computerized program tools relate to the educational goals mentioned in the curriculum) with a mean of (3.54); this might be attributed to the interest of the curriculum designers in achieving the concord between the tools, methods and educational objectives to be achieved. The total evaluation of the field of interaction with the curriculum elements and tools was medium with a mean of (3.25).

Fourth: The field of easiness of usage.

Table (7): Means and standard deviations of the sample's evaluation for the field of easiness of usage.

Item number	Item text	Mean	Standard deviation	Evaluation
31	All the pages of the curriculum are related to the main page which makes it easy to move within them.	3.69	0.80	High
33	The student enters to the curriculum easily and directly.	3.43	1.01	Medium
32	The computerized curriculum allows the student to leave at any part of it.	3.43	0.97	Medium
29	The page includes a descriptive icon of the curriculum.	3.37	0.92	Medium
30	The curriculum introduces a guide for using the curriculum material and tools.	3.21	0.76	Medium
34	The curriculum material is easily uploaded.	3.20	1.01	Medium
Total		**3.38**	**0.66**	**Medium**

Table (7) shows that the evaluation for the item (all the pages of the curriculum are related to the main page which makes it easy to move within them) was high with a mean of (3.69) and the rest of the items were medium in evaluation. This might be due to the huge potentials that are presented by the computer technology, which made it easy for the programmers to choose the best designs among various alternatives and choices; these designs are more suitable for the general goals. The lowest evaluation degree was for the item (the curriculum material is easily uploaded) with a mean of (3.20).

This might be attributed to the many problems that internet users in the southern region suffer from. Among these problems is the speed of the internet, the computers are very old, lack of maintenance teams, pressure and the increase of the internet users. The total evaluation for the field of easiness of usage was medium with a mean of (3.38).

Fifth: The field of evaluation.

Table (8): The means and standard deviations of the sample's evaluations for the field of evaluation.

Item number	Item text	Mean	Standard deviation	Evaluation
40	The questions and drills are graded from simple to difficult.	3.47	0.90	**Medium**
43	Evaluation methods are diverse.	3.40	0.88	**Medium**
39	The questions and drills take into consideration the individual differences.	3.36	1.02	**Medium**
41	The student is immediately provides with feedback.	3.34	1.03	**Medium**
42	The curriculum offers help for the student in case of wrong answers.	3.29	0.93	**Medium**
38	The questions suit the age of the students.	3.28	0.93	**Medium**
37	The questions and drills cover all the content aspects.	3.25	1.06	**Medium**
36	The curriculum includes a post-test that evaluates the students' performance.	3.11	1.05	**Medium**
35	The curriculum includes a pre-test that determines the students' levels.	3.02	0.92	**Medium**
Total		**3.38**	**20.12**	**Medium**

Table (8) shows that all the evaluations for all the items were medium. The lowest evaluation degree was for the item (the curriculum includes a pre-test that determines the students' levels) with a mean of (3.02). this might be due to the fact that the content is designed to fit the individual learning; i.e. in each lesson, the points of strength and weakness can be defined and this can replace the pre-test. The highest evaluation degree was for the item (the questions and drills are graded from simple to difficult) with a mean of (3.47); this might be due to the tendency of the curriculum designers to imply the theories and applications of learning such as the cognitive theory and the behaviorism theory in designing the scientific content which care about the principle of grading from the simple to the more difficult in displaying knowledge and concepts. The total evaluation for the field of evaluation was medium with a mean of (3.38).

Results related to the second question: Are there any statistically significant differences at the level ($\propto = 0.05$) between the teachers' and supervisors' evaluating estimations for the computerized mathematics curriculum in the southern region?

To achieve this question, the means and standard deviations of the teachers' and supervisors' evaluations for each field of the study tool and the total evaluation were estimated. Table (9) shows the results of the evaluations' analysis as follows:

Table (9): Means and standard deviations of the teachers' and supervisors' evaluations for the field of the study tool.

	Group	Mean	S.D
Layout and general information.	Teachers	3.77	0.54
	Supervisors	3.46	0.24
The content of the curriculum and its organization.	Teachers	3.35	0.65
	Supervisors	4.09	0.52
Interaction with the curriculum tools and elements.	Teachers	3.25	0.63
	Supervisors	4.08	0.28
Easiness of usage.	Teachers	3.38	0.66
	Supervisors	3.39	0.39
Evaluation	Teachers	3.28	0.67
	Supervisors	4.52	0.41
Total	Teachers	3.43	0.38
	Supervisors	4.52	0.41

Table (9) shows that there are observed differences between the evaluations of the teachers and supervisors; one- way analysis of variance was used to determine whether these differences are statistically significant at the level ($\propto = 0.05$). Table (10) illustrates the results.

Table (10): Results of multi-ANOVA to investigate the evaluations of the teachers and supervisors.

Hotling value	Significance	(F) value
0.203	12.066	0.00

Table (10) shows that there are statistically significant differences of the level ($\propto = 0.05$) between the evaluations of the teachers and supervisors of the computerized mathematics curriculum. To determine in which field there were differences, ANOVA was used for each field. Table (11) illustrates the results.

Table (11): Results of ANOVA to investigate the differences between the teachers' and supervisors' evaluation.

Field	Source of variance	Sum of squares	d.f	Mean of squares	F	Sig
Layout and general information	Career	6.752	1	6.752	23.654	.00
	Error	85.925	301	.28		
	Total	92.678	302			
The content of the curriculum and its organization.	Career	7.820	1	7.820	18.560	.00
	Error	126.815	301	.42		
	Total	134.635	302			
Interaction with the elements of the curriculum and its tools	Career	9.737	1	9.737	24.987	.00
	Error	117.288	301	.39		
	Total	127.025	302			
Easiness of usage	Career	16.451	1	16.451	38.855	.00
	Error	127.445	301	.42		
	Total	143.896	302			
Evaluation	Career	21.978	1	21.978	50.071	.00
	Error	132.123	301	.43		
	Total	154.101	302			
Total	Career	11.409	1	11.409	52.323	.00
	Error	65.634	301			
	Total	77.044	302			

Table (11) shows that there are statistically significant differences at level ($\propto = 0.05$) between the evaluating estimations of the teachers and supervisors for the computerized mathematic curriculum in favor of the supervisors in all fields and the total field. This might be due to the assumption that supervisors are more efficient in the field of computerization, they take a lot of advanced courses in this field.Moreover, most of them work as trainers for teachers in the INTEL courses and many other courses in the field of computer.

Recommendations

In light of the study findings, the following recommendations are presented:

- Conducting modifications on the basic 10^{th} grade computerized mathematics curriculum in a way that remedies the points of weakness and meets the needs of the students in the Jordanian schools.
- Continuous maintenance of computer labs in the schools that belong to the ministry of education in Jordan, and paying more attention to improving the speed of the internet in the schools that belong to the educational directorates in the southern region in Jordan.
- Conducting more evaluation studies in order to include electronic textbooks of other disciplines and grades.

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