Evaluation of the New 8th Grade Mathematics Textbook Computerized,and Non- Computerized, Activities From Teachers' Points of View

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Abstract: The study aims to evaluate the computerized, and non- computerized activities in the new Palestinian mathematics' textbook for 8th grade according to the point of view of teachers who taught with the book during the last semester and who have long years of experience in teaching mathematics. The researcher developed a new framework from a literature review that was used to evaluate mathematics, computerized activities in the 8th grade textbook. The analysis for this paper was conducted with data using quantitative and qualitative methods, an inter-view & a questionnaire. The questionnaire, which was utilized for this study, consisted of 23 indicators and a 5-point LIKERT scale in light of the framework, 2 Mathematics, teachers interviewed in semi-structured method. A tool of this study validated by a group with expertise in teaching math and tested through CRONBACH'S alpha (0.84). Seventy-two teachers participated in the study, and they select through purposeful sampling using a voluntary process. They contacted through email and Face-book Messenger and provided with a link for the questionnaire designed on a Google Drive sheet. The general result shows a neutral evaluation of the computerized activities, and the same results confirmed through a semi- structured interview. The results showed no significant differences due to gender or years of experience as a teacher, while there were differences between the types of schools, with the government and UNRWA schools on the one hand and private schools on the other. However, the evaluation was a below average for the following indicators: open-ended problems, the induction method, ICT (such as using smart devices), and the simplicity of the language used for computerized activities. In light of these results, the researcher recommends that computerized activities that were rated below average be enriched and that gaps be bridged.

Keywords: Textbooks, Computerized activities, Evaluation framework, Teachers' points of view.

1. INTRODUCTION

The textbooks have strong effects on teaching and learning mathematics [1]. So they are considered to be one of the most important components of a school curriculum; which includes aims; content; methods of teaching and learning, and evaluations.

Textbooks are working tool usually used in schools by both students and teachers [2].

Moreover, mathematics curricula must be designed and analyzed in light of a "common national curricular basis", such as the Brazilian Curricula [3].

Mathematics computerized activities or tasks must be related to realistic mathematics curricula [4].

Teachers' points of view (or attitudes) toward mathematics, textbooks are considered to be very significant for many reasons; first, they use textbooks in preparing their teaching plans. Second, they implement the textbook computerized activities in their classes. Finally, they evaluate their students according to the textbook's content. In addition, HERSH argued, "Mathematics depends on one's conception" [5].

[6] Conducted a survey in 11 different countries about mathematics curricula. They found that there are common learning goals with slight differences in some countries; this result leads us to a common understanding of mathematics computerized activities, which are important parts of school textbooks.

Mathematics content is compressed in school textbooks from grade one to grade twelve according to the Palestinian education system. Thus, teachers and students completely depend on these textbooks for teaching, learning, and testing.

The Palestinian Ministry of Education recently redesigned the mathematics' textbook for the 8th grade. This new edition needs to be assessed by actual teachers who taught mathematics last semester. We also need to how the textbook computerized activities are evaluated in order to make the right decision regarding whether to continue using the new textbook, in order to address its weaknesses, which will be found in this study, and in order to promote its strengths.

Interestingly, no study has yet been conducted to evaluate the computerized activities in Palestinian mathematics textbooks.

1.1 Problem statement

This research tries to evaluate computerized activities in the new Palestinian mathematics' textbook for 8th grade according to the point of view of teachers who taught using the textbook the last semester.

1.1.1 Main question

How do teachers evaluate the computerized activities in the new Palestinian mathematics in the 8th grade textbook as ascertained by using a questionnaire and a semi -structured interview?

1.1.2 Sub-questions

How do teachers evaluate the computerized activities in the new Palestinian mathematics 8th grade textbook in general?

Does the evaluation differ by gender?

Does the evaluation differ by school type?

Does the evaluation differ by years of experience?

What are the teachers' points of view on learning standards, language standards, distributive property and other issues involved in these computerized activities?

1.2 Importance of research

The research will do the following:

It will help us find a theoretical framework to evaluate the computerized activities in Palestinian mathematics' textbooks.

It will help us explore the teachers' points of view regarding the computerized activities in Palestinian mathematics' textbooks.

It will help us bridge the gaps and weaknesses of the computerized activities' weaknesses in Palestinian mathematics' textbooks.

It will help us attract the attention of teachers, stakeholders, and policy makers to issues with the computerized activities in Palestinian mathematics' textbooks.

1.3 Research terminology

Computerized activities: the quality of the computerized activities in Palestinian mathematics' textbooks including reasoning, a student-centered learning approach, active learning, problem solving and utilizing ICT.

Evaluation of computerized activities: a rubric scale designed as a LIKERT method scale which runs from one (strongly disagree) to five (strongly agree).

A teacher's point of view: the teacher's responses to the questionnaire, which affected by the teachers' gender, the type of school they taught at, and the teachers' number of years of experience with teaching mathematics.

Teachers in this study: Palestinian mathematics, teachers who were teaching 8^{th} grade mathematics.

1.4 Research variables

The dependent variable is the teachers' responses to the questionnaire, i.e., 23 indicators, independent variables were gender (a male, female), school type (government, private, UNRWA), years of experience with teaching (1-5, 5-10, more than 10).

2 Method

This section presents the procedures of research, followed by the research sample, and research tools.

2.1 Research Procedure

1) Review previous studies (literature review) to deduce the theoretical framework of this research.
2) Design a survey (a 5-point LIKERT) with the theoretical framework; validate it and test its reliability.
3) Share the questionnaire with a sample population, using a Google Drive sheet to collect data.
4) Submit the link of the questionnaire to the volunteer teachers.
5) Conduct a semi -structured interview with 2 mathematics teachers.
6) Provide an analysis, discussion, and recommendations.

2.2 Research Sample

The research sample for the quantitative data consists of 72 teachers from the West Bank and Gaza chosen through purposeful sampling using a volunteer process. The teachers contacted through email and Face-book Messenger, and provided with a link to the questionnaire that design into a Google Drive sheet. Table 1 represents the demographic distribution of the sample.

Table1. The demographic distribution of the sample

Variables		N
School type	Government	49
	Private	16

	UNRWA	7
Years of experience	1-5	17
	5-10	20
	More than 10	35
Gender	Women	31
	Men	41
Total	**72**	

Table 1, shows that women out numbered men, the majority of schools were government schools, and the majority of teachers had longtime experience with teaching mathematics, with the largest group having more than 10 years.

Table 2 shows personal information about the sample (chosen by purposive method) who participated in a semi -structured interview. The teachers were coded T1 and T2 in accordance with the confidentiality requirements of scientific research and ethical issues.

Table2. Information of the two teachers who participated in a semi -structured interview

Teacher code	Years of experience with teaching	Academic degree	Gender
T1	21	BA in Math Education	Woman
T2	17	MA in Applied Mathematics	Woman

2.3 Research Tool

The data of this study collected through a questionnaire containing A LIKERT scale 5 levels, designed by the researcher upon conducting a literature review. The, draft questionnaire contains 28 indicators, which reduced to 23 indicators according to the decision of validating panels based on the reliability that piloted on 38 teachers out of the sample by using the reliability test of CRONBACH'S alpha, which found to be (0.84). The same 23 indicators were used in the semi-structured interview. The interview videotaped with the help of an Arabic teacher (NADA ALI KHATER).Then, the interview transcribed and read multiple times by the teacher and the researcher until they agreed on the interviewed teachers' views; the two lists of coding were combined into one, which appears in the results' section.

3. The literature Review

This section presents the core topics in computerized activities' analysis that were selected based on previous studies for the purpose of designing the framework for current research.

[7] Proposed a framework to analyze the computerized activities in mathematics textbooks. The framework contains 10 teaching principles: meaning-making, moving from concrete to abstract, repetition and consolidation, active participation, making connections, and transfer, life like situations, motivation, individual differences, and collaboration.

While the studies of [8], [9], and [10] focus on limited standards and principles in dealing with the process of analyzing the computerized activities in mathematics textbooks, namely: creativity, critical thinking, analysis, and synthesis. These skills can be achieved through problem-solving approaches and can raise the performance of students in mathematics.

On a similar note, [11] argued that the computerized, and non- computerized activities that involve reasoning skills such as induction and deduction will be more efficient for developing student skills such as meta-cognitive skills, intuition, mathematical sense, and educated guessing.

[12] study the effects of communication skills in mathematics computerized, and non- computerized activities and claimed that when compared with traditional teaching and learning approaches, communication skills, increase the exchange of mathematical ideas and

Knowledge between students and teachers in a smooth way and help students make progress on achievements in mathematics tests.

Other researchers, such as [13][14], recommend adding coherence standards to mathematical computerized, and non- computerized activities to bridge between students new, and previous mathematical knowledge through a logical manner. This connection will, in turn, be stored in the students' long-term memory for a long time.

From other perspectives, [15] study the effects of having multiple representations of mathematical knowledge included in learning computerized activities. Such representations are useful for empowering stu-

dents in learning mathematics because they utilize real-world situations and the evaluation of the computerized activities will be authentic.

The researcher in [16] encourages mathematics, educators to promote mathematical thinking and mathematics, computerized activities while designing it. This design encourages students to think deeply, intuitively, and logically.

The findings of [17] indicate the importance of the simple mathematical language that has to be employed in mathematical computerized activities for understanding mathematics and for implementing computerized activities in an effective manner.

A group of researchers [18] showed the importance of many of the steps that have to be included in mathematics, computerized activities in order to challenge students and provoke thinking.

Mathematical computerized activities can be more effective if visual aids and graphs are used because this will reduce the abstraction of mathematics to more concrete matters [19].Such aids can encourage students to use their imagination skills.

Open-ended computerized activities in mathematics textbooks promote students' thinking in divergent ways when developing solutions in different ways [20].

The NCTM, [21], p.534) set subsequent indicators so as to be supposed to be integrated in mathematics textbooks:

1. Activities.
2. A suitable amount of experiences.
3. The direct experiences are well-organized when compared to other actual experiences that may possibly be new.

Mathematics computerized activities will be more effective if they contain different methods of assessment, such as summative and formative. Such assessments provide students with direct Feedback on their progress in implementing mathematics computerized activities [22].

In addition to the above findings, researchers from Bauru, namely [23], confirmed the importance of using ICT in mathematics, computerized activities and its effects in raising the achievement of students in mathematics.

According to the above literature review and to the assessment of the quality of the Computerized activities in mathematics, textbooks, and the researcher deduced the following framework for this study. Table 3 represents this framework.

Table3. Framework of the study

Activity feature	General indicator	Expected outcomes
Learning standard	Problem solving, HOTS such as creative, reasoning; induction, deduction, reflections, meta-cognitive, communication, Connections, multiple representations, employing mathematical, thinking, linguistics.	Expose students to computerized activities that include open-ended problems: 1) for example, expose students to computerized activities that include conjectures and argumentation.2) for example, expose students to computerized activities that include communication between students and teachers. 3) For example, expose students to computerized activities that connect new and previous knowledge. 4) For example, expose students to computerized activities that include various representational methods and concrete ideas. 5) For example, expose students to computerized activities that include intuition and educated guessing. 6) For example, using easy and simple language in computerized activities.
The language standard	Mathematical symbols, Context,	Using simpler mathematics language, decrease the abstraction of mathematical computerized activities
Distributive Property	Performance	The expected tasks and work that students will do
Other issues	Teaching, learning, content such as concepts and, facts	Do computerized activities use different methods of assessment such as summative and formative?

This framework used to design the questionnaire by adapting general indicators to more specific, indicators. It has 28 indicators as a draft and then validate through expertise in the field of math education. Based on that, 5 indicators were omitted, so the final number of valid Indicators in the questionnaire was 23, which included: specific, measurable, achievable, reliable, and time-bound (SMART) [24].

4. Result and Discussions

We present the results and discussion questions concerning this research.

4.1 Question number one

How teachers do evaluated the computerized activities in the new Palestinian mathematics in the 8th
Grade textbook in general?

Table 4 represents the average and standard deviation for each indicator of the Questionnaire sorted from the largest means to the smallest.

Table4. Average, and Standard deviation responses of the sample.

Indicator no.	Number	Average	Standard Deviation
14	72	3.70	0.92
9	72	3.68	0.90
7	72	3.65	0.96
10	72	3.65	0.90
5	72	3.58	0.98
8	72	3.58	1.05
6	72	3.51	1.03
12	72	3.47	0.88
2	72	3.41	1.12
21	72	3.41	0.94
17	72	3.38	1.01
22	72	3.36	1.09
23	72	3.36	0.89
19	72	3.33	1.07
18	72	3.30	1.02
13	72	3.25	0.88
11	72	3.23	0.94
4	72	3.22	0.93
20	72	3.13	1.10
15	72	2.98	1.06
1	72	2.84	1.09
16	72	2.75	1.13
3	72	2.55	1.11

From Table3, the total average of all, indicators are 3.32, which is close to a neutral value. This means that the majority of the sample was not sure about the quality of the computerized activities included in the8th grade Palestinian mathematics textbook. Moreover, the indicators of numbers 1, 3, 15, and 16 are below the value of neutrality. Therefore, we need to reflect on these indicators and reform the computerized activities according to these results.

Indicator 15 asked the respondents to decide whether the computerized activities are designed using language that is understandable for the students. The results show that the computerized activities aren't designed in an understandable language for the students; details of indicator 15 can be found in table number 5 below.

Table5. Analysis of indicator #15, in a questionnaire.

Indicator No.	Indicator Statement	Evaluation	Number of respondents	Percent
15	The computerized activities are designed in a language that Is understandable for the students.	Strongly Disagree	7	9.7%
		Disagree	15	20.8%

Neutral	27	37.5%
Agreed	18	25.0%
Strongly Agree	5	6.9%

From the Table above, W can see the results, which are different from those in [25], this indicate that the computerized activities designed; in a language that is understandable for the students, while Indicator 1 in the questionnaire asked the respondents to decide if the computerized activities employ routine problems. The respondents disagreed, meaning that computerized activities have no routine problems that support indicator number 2.Thus, the computerized activities in the8th grade Palestinian mathematics textbook employ no routine problems. This result is in agreement with those of [26], [27], [28], and [29].

Indicator 16 in the questionnaire asked the respondents to decide if the computerized activities employ only one step in their implementation by students. The respondents disagreed, meaning that there is more than one step required to carry out the activity, which supportsindicators1 and 2. Therefore, the computerized activities in the8th grade Palestinian mathematics textbook require more than one step to complete the computerized activities [18], [19], [30], and [31].

Indicator 3 asked the respondents to decide if the computerized activities employed open-ended problems. Unfortunately, the computerized, and non- computerized activities in the 8th grade Palestinian mathematics textbooks do not employ this type of activity, which contradicted the findings of [7],and [32].Therefore, it is necessary to bridge this gap by enriching the8th grade Palestinian mathematics textbooks with open-ended problems and computerized activities .

More details about indicator3 are provided through Table 6.

Table6. Analysis of indicator #3 in a questionnaire

Indicator Number	Indicator Statement	Evaluation	Number of respondents	Percent
3	The computerized activities are designed in an open- ended situation	Strongly Disagree	15	20.8%
		Disagree	20	27.8%
		Neutral	21	29.2%
		Agreed	14	19.4%
		Strongly Agree	2	2.8%

This indicator is the lowest evaluation according to the point of view of the teachers who had taught with the Palestinian mathematics' textbook. Thus, the reform of this indicator is strongly recommended.

4.2 Question number two

Does the evaluation differ by gender? To answer this question, the researcher conducted a t-test to calculate the differences between the means of women and men. Table 7 indicates no significant difference between them.

Table7. T-test analysis of the gender variable

Gender	N	Mean	STD	DF	T	Sig
Variable						
Women	41	3.3	0.49	70	0.08	0.9
Men	31	3.3	0.55			

Table 7 shows no large diversity among women and men in requisites by the evaluation, the computerized activities in 8th grade Palestinian mathematics textbooks. The researcher expected this result because the tool of this research is highly accurate.

4.3 Question number three

Does the evaluation differ by school type? To answer this question, the researcher conducted an f-test to calculate the differences between the means of school types. Table 8 indicates the analysis between them.

Table8. F-test analysis of school type variable

School type	N	Mean	STD	DF	Squares of means	F	Sig.
Variable							
Government	49	3.3	0.46				
UNRWA	16	3.5	0.47				
Private	7	2.8,	0.67	2	1.1	4.6	0.01*
Total	72						

** p<0.05*

Table 8 shows significant differences between the means of the variable of school type. The researcher conducted the SCHEFFE test as in Table 9.

Table9. SCHEFFE test

School type	Differences between Means	Sig
UNRWA	-.2409	.239
Government Private	.4296	.102
Government UNRWA	.2409	.239
Private	.6704*	.014
Government Private	-.4296	.102
UNRWA	-.6704*	.014

The significant difference in Table 8 was between the government and UNRWA schools on one side and private schools on another side. This result indicated that private schools evaluated the computerized activities in the8th grade Palestinian mathematics textbooks lower than did the government and UNRWA schools. It is important to note that private schools score higher in TIMSS than do the government and UNRWA schools. Moreover, private schools use different mathematics resources to support learning mathematics. The result supports the general trend of this research (neutrality), as mentioned earlier.

4.4 Question number four

Does the evaluation differ according to the years of experience a teacher has? To answer this question, the researcher conducted an f-test to calculate the differences between the means of the variable years of teaching, the teachers whom participated in responding to the questionnaire. Table 10 indicates the analysis between the means.

Table10. F-TEST, Analyses of the years of experience variable.

Years of experience,	N	Mean	STD	DF	Squares of means	F	Sig.
Variable							
1-5	17	3.22	0.51				
5-10	20	3.26	0.52	2	0.23	0.88	0.41
More than 10	35	3.40	0.50				
Total	**72**						

Table 10 shows no significant difference between years of experience in evaluating the computerized activities of Palestinian mathematics' textbook for 8th grade. The researcher expected this result because the tool of this research is highly accurate.

4.4 Question number, five

What are the teachers' points of view on learning standards, language standards, distributive properties and other issues with these computerized activities?

Table 11 shows the result of a semi -structured interview concerning learning standards of students that should be included in the structure of the computerized activities in mathematics textbooks.

Table11.Teachers views on learning standards

Categories		**Codes/ teachers**	**T1**	**T2**
Learning standards	Positive	Routine Problems	□	□
	Negative	None Routine Problems	□	□
	Negative	open-ended problems,	□	□
	No agreement	Deduction methods,	□	□
	Negative	Induction methods	□	□
	Negative	Communication, between students themselves	□	□
	Negative	Communication, between students and teachers	□	□
	Negative	connect new, and previous knowledge	□	□
	Positive,	Multiple representations	□	□
	No agreement	Modeling	□	□
	Negative	ICT	□	□
	No agreement	Logical thinking,	□	□
	No agreement	Intuition thinking	□	□

Note"□" denotes appositive evaluation from the teacher, while "□" denotes a negative evaluation

The teachers' views are categorized into two themes: a positive theme, which means that the features are included in the activity, and a negative theme, which means that the features are not included in the activity. Both teachers agreed on two positive features, routine problems and multiple representations, while they reported a negative evaluation of no routine problems, open-ended problems, induction methods, and communication between students, communication between students and teachers, and connecting new and previous knowledge. They' did not agree on other indicators. Therefore, we can conclude the weaknesses of the computerized activities from this table, in the same manner, Table 12 shows, and teachers' views on language standards.

Table12. Teachers views, on language standards

Categories		**Codes/teachers**	**T1**	**T2**
Language standards,	Positive	Daily life/real life	□	□
	Negative	Easy language	□	□
	No agreement	One step solution	□	□
	No agreement	Multiple-step solution	□	□

Table 12 shows one positive feature that is included in language standards, which is about real life and is included in computerized activities. The teachers did not agree on the rest of the language standards, which means that the language of the computerized activities is hard for our students to realize. The same result is found in Table 13.

Table13. Teachers views, on distributive property and other issues with the standards

Categories		**Codes/teachers**	**T1**	**T2**
Distributive property and other issues	No agreement	Formative evaluations	□	□
	Negative	Summative evaluations	□	□
	No agreement	Logical structures	□	□
	Positive	Factual knowledge	□	□
	Positive	Conceptual knowledge	□	□
	No agreement	Procedural knowledge	□	□

Table 13 shows that there were just two points of agreement by both teachers on distributive property and other issues due to the standards: factual knowledge and conceptual knowledge. Therefore, other issues remain unclear for teachers and students.

5. Conclusion

Analyzing the results of this research show teachers evaluated the computerized activities in the new Palestinian mathematics 8th grade textbook. The teachers' evaluation was not high enough, sitting at around average (3 out of 5); other indicators were below average. The data collected from the interview confirmed the same results. Therefore, it is necessary to reconsider the approval of these computerized activities and make substantial efforts to reform the computerized activities because these curriculums are still in the pilot stage.

6. Recommendations

In light of these results, the researcher would recommend that the following important points be considered further:

- There is a need to increase interest in computerized activities that contain open-ended issues.
- There is a need to activate methods of extrapolation due to the computerized activities in a better way.
- Computerized activities that help students employ modern technology (such as tours and computers) should be encouraged.
- There is a need to formulate computerized activities in an easy language for students.

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