

# The Implementation of Digitalization System in Education in Palestine

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## Abstract

*This paper summarizes the experiment of digitalization of education in some schools in various governorates in Palestine, it explains the concept, provides an overview of the implementation of the system and it examines the effects of the digitalization system on education in the second semester of 2016/2017. In addition, it shows the suggestions, the recommendations and the challenges for the development of the digitization system to improve its performance in the future. Moreover, this research removes the gap of lacking in local researches in Palestine.*

*It is an experimental design approach. Several tools were used in data collection; such as focus groups, interviews, class room observations and experimental design groups. The groups in this research were selected randomly from the fifth grade and sixth grade. The effectiveness of using the digitalization system was tested by t test.*

*The effectiveness of the digitalization system was divided in two sections. First, the educational achievement of students in Arabic and geography subjects was significant during semester. Second, the behavioral achievement was effective during the classroom such as low levels of boredom, fear, anxiety and tension were noticed.*

## 1. Introduction

Nowadays, technology using is preferred by all of us, since you can get what you want in less time and effort also nobody ever expect our world without technology especially children who are in their first years of life, since they daily use technology in playing phones, tablets and computers. Despite the side effects of using technology, it can be used effectively to create educated generations by using the available tools in an appropriate way to get all helpful information. It was hugely noticed that the interest of student moves far away from the educational aspects and the boredom of the educational process that completely depends on the teacher is more noticed. Moreover, the student's achievement level was decreased. Here, the role of the educational system

is to use these tools which are preferred by students and this system is the basic field that build society.

## 2. Literature review

In the developed countries, such as Tehran. The use of ICT (Information and Communication Technology) system in the schools of the developing countries among students who haven't the accessibility to use technology in their homes is considered as a chance for learning new skills [1].

Digital education in India is interesting among the stuff who implements the system and it is effective for the students. The challenge in this system is that the Indian people do not have the required internet band width especially in the rural areas [2].

In Turkey, evaluating the usage of smart boards and Tablet PC's in the Turkish educational system showed that –according to teacher viewpoints – a significant difference on the distribution of Tablet PC's in favor of the male teachers, supposing that male teaches adapt more easily to Tablet PC use. Also, a significant difference according to branches in favor of skills classes (music, art, physical education, etc.) and against the physical sciences, verbal and vocational classes. In general, the teachers agree with using smart boards in their classes. On the other hand, they disagree with Tablet PC's distribution in the class. Teachers did not consider Tablet PC distribution as a positive development because they influence students' motivation to classes in a negative manner. Teachers need more training in using Tablet PC and smart boards with the contents of the classes. [3]

But in Japan, the application of the digitalization system was different. There were two types of systems which conducted on elementary and secondary schools. In addition, the teachers were affected by several aspects, the first model was modular learning system which improve the student's ability and concentration through brain training by testing the speed and accurate, retain the information also improve the academic ability. The second model was the collaborative learning support system that was focused on the

communication between the teachers and the students. These two models used tablets and other types of devices to improve the knowledge, skills and the collaboration to solve problems, regardless the changes that may occur in the stuff of the Japanese schools. The tests of the first system were used in this study usually in the morning, and the statistical data was obtained in two years, the results of student's ability to concentrate and retain information was improved. The relationship between academic ability in mathematics, Japanese language, English language and the concentration or retention was highly correlated, but social/natural academic ability with concentration were not strongly correlated since students were not interested in these subjects.

The second system, collaborative learning support system, was focused on learning and communication. In the class room the students replied on questions on a tablet or other device then shared their answers by using an electronic white board. The observation was done through using this system about the accessibility to answer correctly on these subjects, Society, Mathematics, English, Arts, Science, Music and Moral. The notes that taken from the teachers are: the capacity of thinking and participating of the students were increased, the awareness of different ideas and opinions was increased as resulted in more cooperation.

The teachers were affected positively by using this system. First, the teachers can collect all opinions for all students in the class room, after sharing the opinions of the students, the communication between teachers and students themselves was accelerated. Second, the students were studied the problems and expressed their opinions more than before using the collaborative educational support system [4].

In Palestine, there are many technological tools in schools such as (computers, interactive boards, LCD projectors, etc.) which are used as explanation tools to improve student's comprehension and understanding. After viewing the Japanese experiment and other countries experiments regarding digitalization of education, in September 2015, a formal decision was made by the Palestinian Council of Ministers concerning the digitalization of the educational system as a national project led by the Ministry of Education with cooperation of the public and private Palestinian sectors.

In July of 2016, a Palestinian staff consisting of employees and engineers from the Ministry of Education, attended a workshop in Jordan which was under the assistance of directors and supervisors from Intel Semiconductor Manufacturing Company, Microsoft Corporation Technology Company, to view and to benefit from the digitalization of educational experiments in

other countries also to suggest a digitalization educational system to be implemented in Palestinian schools. In September 2016, the municipalities with the Ministry of Local Government, Paltel Company, AMIDEAST Organization, Coca-Cola Company, and other donors started to present financial tender to prepare the pilot schools for the new system. The system started to be implemented on these schools, the fifth and sixth grades in thirty-seven schools after the teachers had been trained.

A national team for digitalization of education in Palestine consisting of specialized engineers and supervisors from the Ministry of education was created for this mission. The team was responsible for teachers' training to improve the technological capabilities. The training is divided to technical training, educational training, and classroom management training. In addition, the team was responsible for following up the infrastructure and internet network of the system, providing digital content of the Palestinian curriculum and the benefits that could be earned from the Palestinian education portal, which contains thousands of learning blocks, videos and educational materials that are accessible to teachers easily. The Palestinian digitalization system consists of the following devices, the charging and storage unit, the educational 2-in-1 Detachable Tablets, PC Interactive Projectors ,2-in-1 Detachable Teacher Notebook, Mobile Server Access point (the needed access point was content access point which Israeli authority refused to pass it from the borders).

Although there were many challenges in implementing the system, there were initial positive effects that were obvious in the digitalized schools, some schools out of the pilot were joined to the digitalization system family so the number of digitalized schools increased to seventy-five schools in different Palestinian directorates at the end of the second semester of 2016/2017.

### 3. Methods and Methodologies

The present research is experimental design approach which was used to formulate the fact that digitalization system could be an effective system to improve the quality of education. And it was used to determine the suitable infrastructure, the challenges and the recommendations for the application of digitalization system. Several tools were used in data collection, it was obtained through experimental design groups, focus groups, interviews, documents and class room observations. The experimental design approach of 21, 23 students of experimental and control group, respectively were selected randomly from Mariam AL Athra girls elementary school from fifth class. And 21, 23 students of

experimental and control group, respectively were selected randomly from Mariam AL Athra girls elementary school from sixth class. The selected population was chosen because Mariam AL Athra girls elementary school in particular has diversity in the educational achievements and behaviors of students, in addition the number of the students in each class were nearly representative for the number of students in the classes in governmental Palestinian schools.

The focus group was conducted in two schools for two hours, the first focus group was done in Mariam AL Athra girls elementary school, was consisted of the headmistress and seven teachers who are using the system. The second focus group was done in Moghtarebi Bir Nabala School, was consisted of the headmaster and six teachers who are using the system.

The interviews were conducted in the Ministry of Education with the supervisors, engineers and trainers to provide the feedback during the implementation of the system, the needed information and necessary documents.

Class room observations were noted the behavior, interaction of students and difficulties in using the system from different schools, Jericho Secondary school, Tormmous Ayya Girls School, Bent Al Azwar and Mariam AL Athra Girls elementary school.

The methodology in the research was applied in four dimensions as shown in Diagram 1.

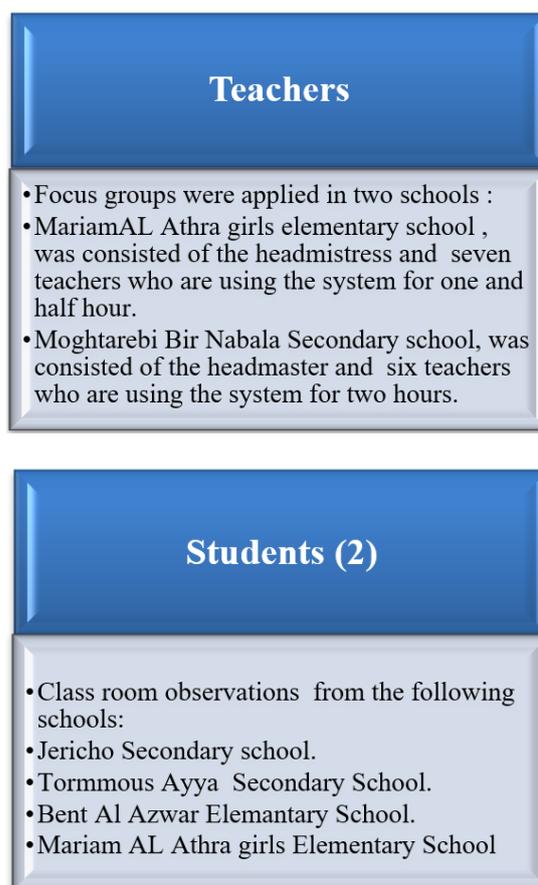


Diagram 1. Four Dimensions of the Research

#### 4. Analysis of Findings

All students were taken a quiz and data was collected from Mariam AL Athra girls' elementary school from the fifth and sixth classes, also after the second semester was ended, the students' marks were collected for the two semesters. The notes from interviews and the focus groups were recorded. The class room observations were noticed during the class room. Data analysis was performed for all students' mark who had completed the quiz, independent t-test which was used to check the significance effect of using the digitalization system between the experimental and control groups .At the end of second semester, a paired sample t-test was used to check the significant difference in students' educational achievement between the two semesters to see the effect of digitalization system on achievement

The effectiveness of the application of the system was divided in two sections, the behavioral and the educational achievement of students.

The behavioral section is effective for several causes. First, boredom was decreased in the class room. Second, excitement was increased due to using of tablets. Third, fear, anxiety and tension were decreased. Also, the quite medium and high

level of concentration appeared since the teacher can look at the students' screen on the interactive board at any time. In addition, the interaction was increased in the classroom especially within students who were inactive and had weak personalities. Moreover, the frequency of absence during the semester and the number of times students leave the classroom during the class period were decreased during the implementation of the system.

The second section was the educational achievement of students which was increased during the implementation of the digitalization system especially among students who had low level of achievement. Also, the confidence of the students' themselves was higher when using the tablets and the understanding in the class was improved by using different types of digital methods (pictures, videos, interactive work sheets, etc.). In addition, the investment of class period was evident as resulted from the high understanding and concentration levels of students.

There were some challenges that mentioned during the interviews and focus groups. Firstly, a big budget will be needed in the future to cover all the schools which must be taken into consideration by the State and the donors. Secondly, the training of the teachers was faced difficulties especially among aged teachers who weren't use technology techniques, so they will be needed more training.

In addition, students couldn't take their tablets to their home to solve the homework, also the curriculum was not web-based. Moreover, there was a lack in the interactive materials that needed to apply the digitalization system. Also, there were problems in the network and sometimes the Wi-Fi was going to fall over. Finally, The needed access point refused to be passed form the borders (i.e.: Education Content Access Point, which is an easy-to-use device specifically designed to store, manage, and distribute digital content where connectivity is low, doesn't exist, or there are some problems in internet connection).

The SPSS analysis of the students' marks was used to analyze data. as seen in the result, the digitalization system was effective to improve the educational achievement, there was no low scores after implementing the digitalization system in both subjects (Arabic, Geography). Also, the educational achievement in both subjects is higher in the second semester that implemented the digitalization system compared with the first one. In addition, the students' marks were significant difference in Arabic subject in the class period which implemented the digitalization system compared with traditional class. On the other hand, there was no significant difference in Geography subject in the class period which implemented the digitalization system compared with traditional

one. The explanation of the non-significance difference in Geography class may the aged teacher and non- familiar with the digitalization system.

### 5. Discussion

The SPSS analysis of the students' marks showed that the digitalization system was effective to improve the educational achievement; there were no low scores after implementing the digitalization system in both subjects (Arabic, Geography) as shown in the following figures. Figure 1 shows that there are no low marks in the experimental group compared with the control group in Arabic subject of the fifth class.

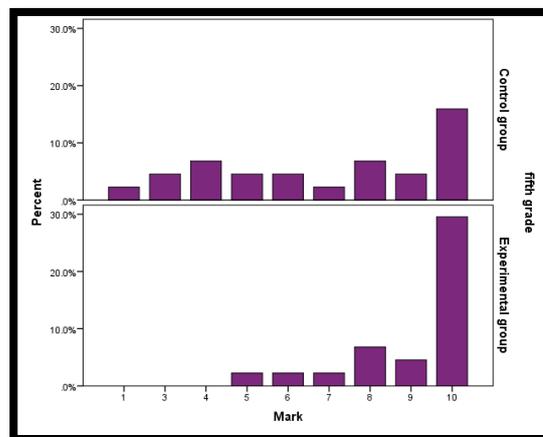


Figure 1. Comparison of the Experimental Group and Control Group in Arabic subject of the Fifth Class

Figure 2 shows that there is no low marks in the experimental group compared with the control group in Geography subject of sixth class.

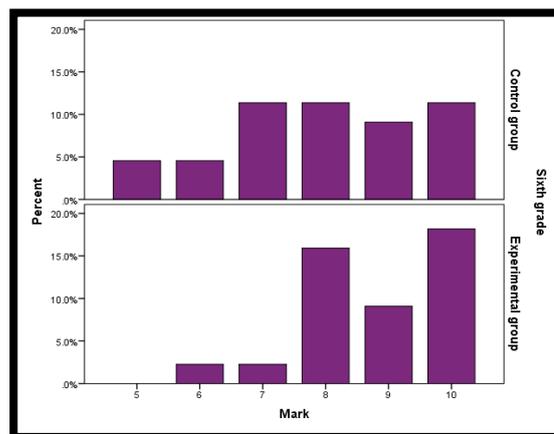


Figure 2. Comparison of the Experimental Group and Control Group in Geography subject of Sixth Class

Figure 3 shows that there is no low marks in the experimental group compared with the control group in the fifth class.

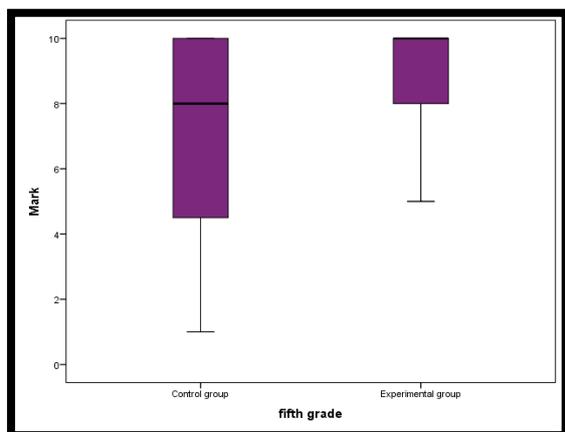


Figure 3. Comparison of the Experimental Group and Control Group in the Fifth Class

Figure 4 shows that there is no low marks in the experimental group compared with the control group in Geography subject of sixth class.

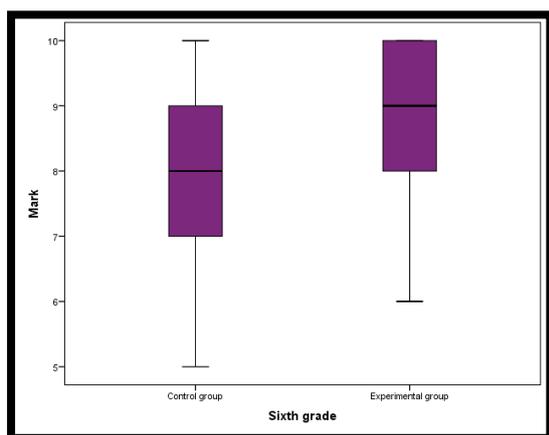


Figure 4. Comparison of Experimental Group with the Control Group in Geography subject of Sixth Class

Also, the educational achievement in both subjects is higher in the second semester where the digitalization system was implemented in comparison with the first semester by using paired sample *t-test*, there was strong evidence of significant difference between the first semester and the second semester for Arabic and Geography (*P-values* = 0.002, 0.000), respectively. There was a significant difference in students' marks in the Arabic subject during the class period where the digitalization system was implemented in comparison with the traditional class by using ANOVA *test* (*P-value* =0.005) as shown in Table 1 and Figure 5.

Table 1. ANOVA Test (Arabic subject)

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	48.000	1	48.000	9.004	.005
Within Groups	223.909	42	5.331		
Total	271.909	43			

Table 1 shows the strong evidence of significant difference in fifth-grade in Arabic subject between the control group and the experimental group, so the null hypothesis was rejected ( $H_0: \mu_{\text{control}} = \mu_{\text{experimental}}$ ).

Figure 5 shows the slightly increase in the second semester compared with the first semester in Arabic subject of fifth class.

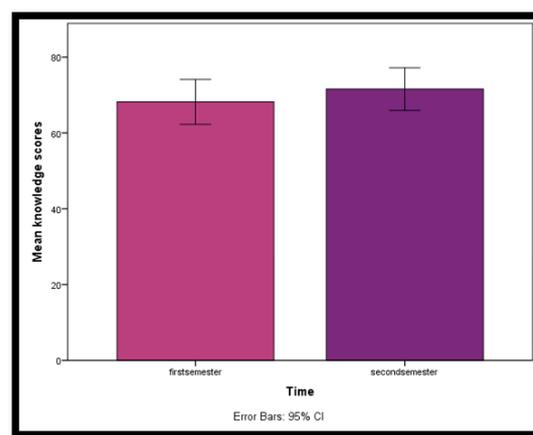


Figure 5. Comparison of the Second Semester with the First Semester in Arabic Subject of Fifth Class

On the other hand, there was no significant difference in Geography subject in the class period which implemented the digitalization system in comparison with traditional one by using ANOVA *test* (*P-value* = 0.05) as shown in Table 2 and Figure 6. The explanation of the non-significance difference in Geography class may be the age of the teacher and being non- familiar with the digitalization system.

Table 2 shows that there is no significant difference between the control group and the experimental group in sixth-grade in Geography subject, so the null hypothesis could not be rejected ( $H_0: \mu_{\text{control}} = \mu_{\text{experimental}}$ ).

Table 2. ANOVA Test (Geography subject)

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	7.987	1	7.987	4.081	.050
Within Groups	82.195	42	1.957		
Total	90.182	43			

Figure 6 shows the slightly increase in the second semester compared with the first semester in Arabic subject of fifth class.

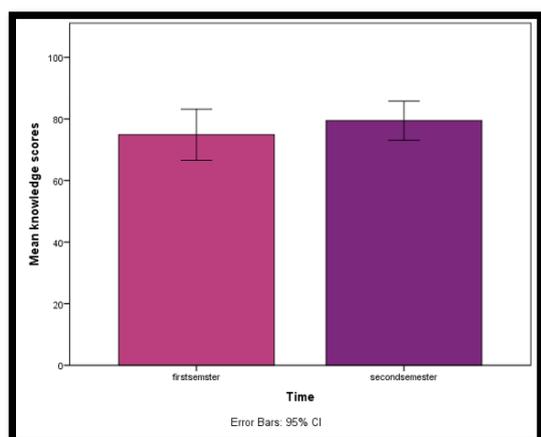


Figure 6. Comparison of the Second Semester with the First Semester in Arabic Subject of Fifth Class

## 6. Recommendations

There were few limitations that should be noted in this present research. First, most of the studies that examined the digitalization system, already had this system in their countries. Second, there was no study on digitalization system done in Palestine. Since all of the studies that was reviewed, it was conducted more in developed countries. In addition, teachers who used this system usually faced challenges to deal with this system especially who were from different faculties and ages.

The recommendations based on the present study that supports the evidence that digitalization system could be an effective education and attractive system at the same time. Generally, the implementation of this system in all schools in Palestine need a huge funding to cover the cost and the expenses for providing system tools and teacher trainings. Also, this research suggests making interactive platform to make it easier for teachers for more benefits from the videos and interactive exercise. Finally, since digitalization system in

Palestine in its initial steps, the implementation of this system on other stages of education in schools is recommended to increase school achievements and improve students' behavior.

## 7. Conclusion

To conclude, the digitalization system with its special characteristics, which make it is more effective, attractive, usable and understandable being compared to the traditional education system. Moreover, the digitalization system is considered an effective way to ease learning process and encourage students to improve their achievements. In addition, it is beneficial to focus on the interactive medium of education. It has also changed the learning process to concentrate on students instead of teachers. The added value by this research removes the gap of lacking in local researches. Also, this research explains the suitable infrastructure of implementing the digitalization system in Palestinian schools.

## 8. References

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