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Combine sociological theories with Technology as a vital Tool in Teaching Mathematics in Arab Middle School Students in North Israel

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Abstract

This research paper examines the role and importance of technology learning Mathematics in Arab middle schools in North Israel. This kind of research is important for the major role that sociological theories and technology plays in enhancing the learning process and creating a positive and permanent effect in how students acquire Mathematical skills. Especially that most of the schools in Arab middle schools in North Israel don't have any kind of technological systems that can be used in order to apply these concepts, the researcher use the mixed method to answer the research questions and the research is going to involve 120 students in the middle school students in north Israel, after analyzing the data and writing the findings, the researcher wrote the results and recommendations.

Keywords: sociological theories,Technology, Teaching Mathematics, Middle school, North Israel, Arab Sector.

Introduction

Today, technology plays an important and major role in the modern world that we live in. Lots of professions that did not require the usage of technology in previous years demands this nowadays. Moreover, most houses have lots of technological devices such as computers, laptops, pads and smartphones. And an increasing number of people rely on them each day in their daily life. Technology is being used by adults and children every day in web surfing, sending sms, social media, interactive games and in lots of activities. We are considered as a technological developing society where technology is an irreplaceable part in our daily life. Thus, using technology and teaching students how to use it and benefit from it is a necessity in modern schools.

These days, there are continuous concerns in raising the students 'qualifications using technology as a method. Decision makers are updating their strategies in applying teaching programs and methods for enhancing the students' skills in schools. Using technology in our education system is an urgent need for its dominance in our daily life, if we want to convert the teaching process to have more effects on students and how they learn. Technology has an

important role in the learning process for the students, because it makes them actively serious in learning and involved in the whole educational process. Therefore, this helps them most of the time in acquiring information in a better way. Because of the spread of technology globally in such a vast way, students are attached to it. Technology causes better learning experiences, in addition, it can introduce more interactive styles that can be adopted in all subjects' curriculums, (costly, 2014.)

Students these days are learning in a different method than previous generations. They are directed by technology and have fast access to a wide variety of data. Despite the fact that the majority of students have access to technology at home, less than half of them utilize it for schoolwork. Pedagogy must evolve to keep up with the trends. Usually, in the case that teachers maintain to teach topics and skills in the traditional manner, without using any kind of technology, students will lose interest and may lose their motivation in that given topic or class. Especially, that students these days are surrounded with all kinds of technology and rely on them in their daily life and are bound to it. So using technology can improve their learning process, their motivation and can create a positive classroom environment as a whole.

Arab middle schools in Israel are known for their own difficulties, lifestyle and problems. Some of these pedagogical problems and difficulties concern students' motivation and skills towards learning, especially Mathematics, which is low. Their level is less than average. Thus, all kinds of problematic issues such as giving the requested materials, behaviours inside the classroom and motivation, are encountered. Moreover, only few students in each class have or can reach basic technological devices in their homes such as computers and internet which leads to a lack of encountering or using technology specially that they never use it in their surroundings.

From the standpoint of both students and instructors, the use of technology in education has been shown to perform better academically (Courville, 2011). As a Mathematics teacher in the …… region, I have countered many difficulties regarding passing the requested materials to my students and raising their performance to the required level. These problems cause can be summarized as two major points:

- The lack of using and practicing Mathematics skills as the students ' surroundings doesn't require using such skills.
- The lack of motivation for learning Mathematics.

Therefore, using technology as a method of teaching Mathematics helped me to reduce these causes by integrating technology in my classes. I found an improvement in students' motivation and found a way to make them use Mathematics skills and practice it throughout visuals and auditory lessons.

The study spots the light on how technology can improve the students' learning process, performance and their motivation inside the classroom in addition to creating a positive classroom environment. Especially that the Arab's middle schools in Israel lack

technological devices such as computers, projectors and smart boards and the majority of educators in that region are content with using only the frontal teaching approach.

From all of the above, the research questions are derived:

In general, the primary question that motivated this paper is: Does employing technology improve students' Math learning? The following are some of the questions that were also looked into:

1. Is there a relationship between technology and student's motivation for learning?
2. What is the relationship between technology and the classroom environment?

Theoretical Background

As the application of mathematics has grown in prominence, so has the demand for skilled teachers to teach students the necessary mathematical skills. Although some teachers use "leading-edge" technology, most teachers continue to teach traditionally. None of this conventional etiquette is harmful to students. In reality, they have been shown to apply to date. There are, however, numerous possibilities for pupils to acquire confidence, practice, and extend themselves, particularly for students who master such abilities for reasons other than passing courses.

Nowadays, stereotypical traditional education techniques and environments are unpopular. In contrast, multimedia technology with audio-visual animation effects naturally and humanely increases our access to information, with much information and time and space crossing features. Multimedia technology provides a sense of realism and performs admirably, cultivating students' interest and enthusiasm in studying and their participation in-class activities. Furthermore, multimedia enhances teaching content and maximizes class time, breaking the "teacher-centered" teaching pattern and increasing class efficiency. Because of the enormous number of students in each class, it is difficult to get enough practice time. Due to traditional classrooms, the old teaching approach primarily focused on teachers' instruction, and the material offered was limited. Multimedia technology, on the other hand, crosses time and space to create a more dynamic, visual, and realistic educational environment for Mathematics, boosting students' initiative while lowering class time and improving class knowledge 2012 (Shyamlee and Phill).

Technology has enabled educators to be more innovative, resulting in more efficient and effective education, whether online or offline. Technology has aided in enhancing classroom activities, the motivation of students, and their participation in classroom activities. The more pupils who participate, the more they should learn while having fun. This is especially true when teaching math skills, as more engagement in the classroom is required. Tabatabaei and Gui (2011).

The creativity of students can be stimulated by technology, which can immerse them in a variety of situations. Due to technological advances, learners can focus on self-actions, privacy, and a safe

environment where mistakes are handled and detailed feedback is provided. The capacity of a machine to track faults and link the student to activities that focus on specific problems adds to the value of machine feedback. Qualitative feedback in software is becoming increasingly important, according to research. The value of technology is increased when links to explanations, further support, and references are offered. Furthermore, The Internet is such a well term that people across the world use constantly. Students increasingly utilize the Internet in class to learn maths. Online training looks to be engaging in the classroom and encourages students to seek out suitable materials. Students are asked to perform the problems that are offered online. By using the Internet, we can acquire information from a variety of resources for any task. Students can develop their skills by using online resources (such as online conferences) and other tools to communicate with others. These learning methods have been shown to boost student learning and compensate for deficiencies in areas where students are weak. Online conferences help improve intercultural awareness, motivation, and interaction.

Students can use the internet to access a range of educational materials, such as audio, video, radio, and television shows, games, voice recordings, quizzes, and podcasts, among other things. This introduces learners to a wide range of target Mathematic skills while also assisting them in improving their speaking abilities, (Bahadorfar&Omidvar, 2014).

Handley (2008 discovered that a group of students who were on the verge of failing in school improved their ambition and abilities to become self-directed, cognitively active, and performance-enhanced students, giving them a better chance to become responsible and productive members of their communities. Unlike many of the most recent models for working with at-risk kids, which emphasize behaviorist management principles and remediation as the primary focus of learning, the model developed from his research is constructivist in character and emphasizes higher-order thinking skills. For individuals who are now unable to attend classes, this provides a feasible option because they do not match the behaviorist model.

In addition to enhancing students' mathematical learning, technology can also encourage them and positively impact the classroom environment as a whole. According to research by Godzicki, Krofel, and Michaels, a rich-technology class can lessen several negative behaviors, including homework not being completed, being unprepared for class, and unmotivated students sleeping. The study discovered that pupils were more inclined to participate in an activity solely because the technology was employed. Students said that professors provided relevant activities, and overall motivation and engagement increased by 9%.

Methodology

Mixed Method: Qualitative research and observation, which is going to be held in Arab middle schools in Israel.

Participants in the Research:

The research is going to involve 120 students in the School.

Research Tools:

The researcher uses a questionnaire which is given to students to fill in also anQualitative for the students.

Research procedure:

Questionnaires and observations regarding the subject will be held with students. A questionnaire will be given to students and will be consisted of three main questions:

1. Please specify with a (X) which term corresponds to your response from the following objects you utilize to develop your Mathematical skills.

2. How frequently do you utilize the below mentioned technologies to enhance or improve your mathematical knowledge and skills?

3. What are your thoughts on using technology to help you learn mathematics?

In addition to the questionnaire, I will divide each 7th and 9th grade into two groups. Two 7th graders that I will adopt technology in teaching one of them and the other 7th grade will be taught in a traditional frontal way. The same thing for the 9th graders. And I will observe the classroom environment in general in each group such as (classroom motivation, participation, and noise inside the classroom). At the end the results will be compared between each group of each level. Afterwards, there will be an analysis of the questionnaire, observations and the theoretical materials. At the end, there will be a summary of results and conclusions.

Findings

In this section a data gathered from the questionnaire and the observation will be reviewed. First section will review the questionnaire findings and results and the second section is regarding the observation finding and results.

Questionnaire: The questionnaire was distributed to 110 students.

Question number 1: How frequently do you utilize the following technology to expand or improve your knowledge and skills in mastering mathematics?

The results came as follow:

technology	**Always**		**Sometimes**		**Never**	
	No.	%	No.	%	No.	%
Computer software for learning Mathematics	57	52	31	28	22	20
Social networking sites	68	61	30	27	12	12

(Facebook, twitter, Instagram)						
Online audio and video websites(YouTube)	49	45	29	26	32	29
Smartphone laptops apps (learn Mathematics)	45	41	23	21	42	38
Word processing (Microsoft word, excel)	17	15	16	15	77	70

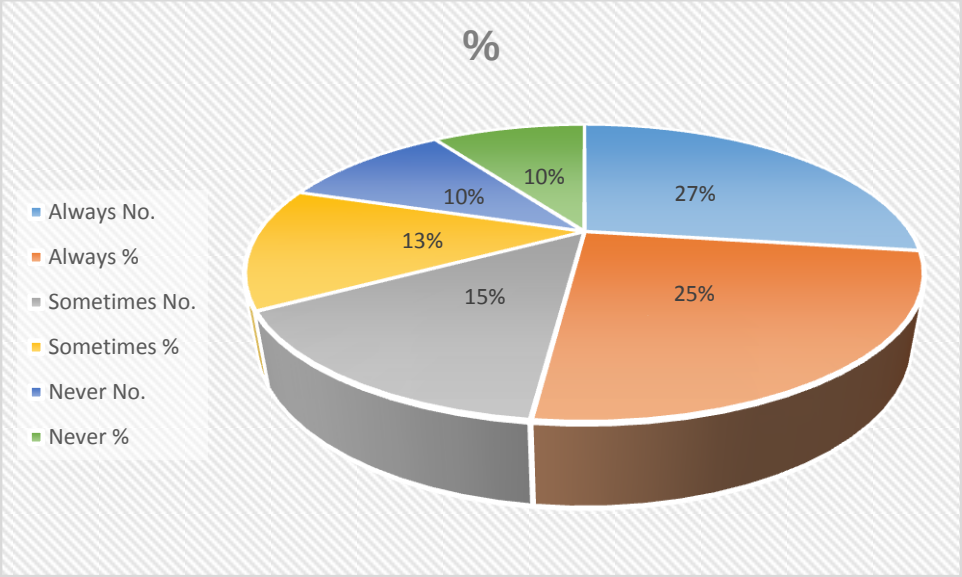

Fig 1: How frequently do you utilize the following technology to expand or improve your knowledge and skills in mastering mathematics?

Question number two: What are your thoughts on using technology to learn mathematics?

The results came as follow:

Attitudes of technology undecided	**Strongly agree**		**Agree**		**Undecided**		**Disagree**		**Strongly disagree**	
	No.	%	No.	%	No.	%	No.	%	No.	%
While learning math skills, I appreciate using technology.	52	47	41	38	9	8	8	7		
I'm aware that technology can assist me in improving my math skills.	31	30	44	40	17	15	11	10	7	5

I improve my abilities by using Mathematical skills software or apps	46	42	33	30	7	7	10	9	14	12
I prefer using technology to enhance my skills.	57	53	29	26	3	3	17	15	4	3
I believe that following online math videos inspires me to learn increasingly difficult tasks.	60	55	35	32	5	4	10	9		
I really like learning the Mathematics on online websites	25	22	34	32	9	8	33	30	9	8
Multimedia, in my opinion, is a wonderful method for learning mathematics.	61	55	42	38	7	7				
I believe that employing technology to develop mathematical skills is unnecessary.	13	12	8	7	15	14	48	44	26	23
I think that using technology to improve my mathematical skills is more beneficial.	53	49	29	26	19	17	9	8		
Social networking sites helped me to improve my math thinking skills by debating and arguing	23	21	42	38	11	10	24	22	10	9
I think videos help me to improve my re-thinking	13	12	21	19	31	28	23	21	22	20

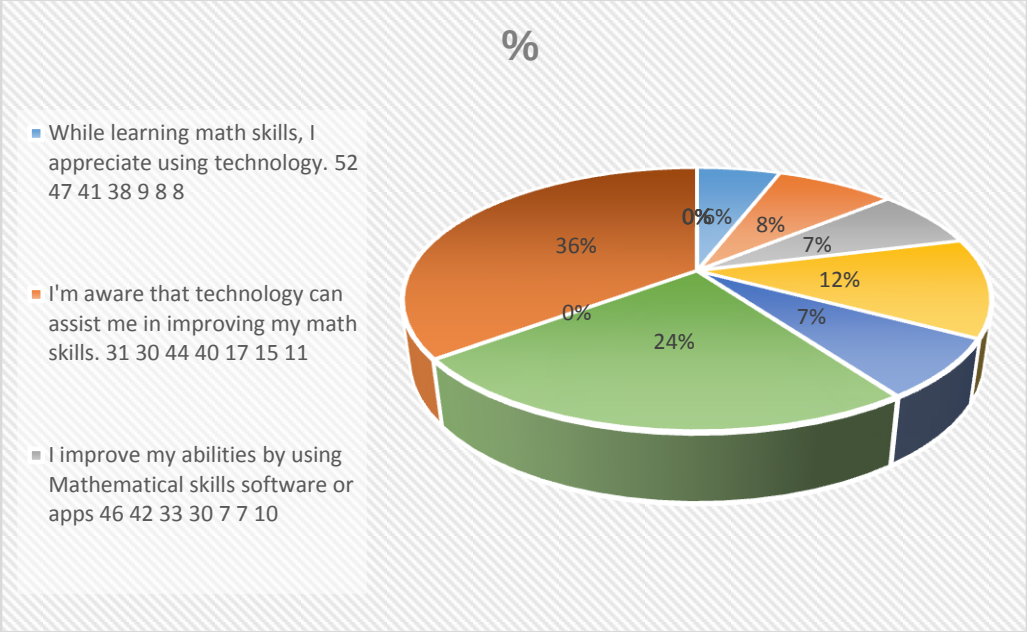

Fig 2: What are your thoughts on using technology to learn mathematics

Question number three Which of the following technologies is best for improving or reinforcing your knowledge and skills in mathematics?

	Strongly agree		**Agree**		**Undecided**		**Disagree**		**Strongly disagree**	
	No.	%	No.	%	No.	%	No.	%	No.	%
Computer software for learning Mathematics	44	40	39	36	17	15	10	9		
Social networking sites	58	53	37	34	8	7	7	6		
Online audio and video websites(YouTube)	39	36	41	37	22	20	5	5	3	2
Smartphone laptops apps	47	42	38	35	11	10	5	5	9	8
Wordprocessing (Microsoft word, excel)	26	24	33	30	32	29	8	7	11	10

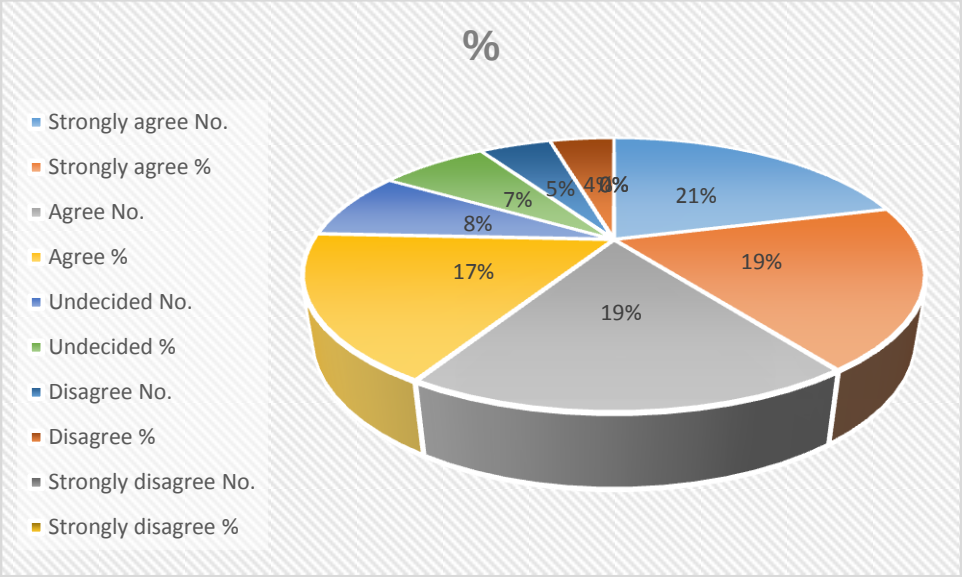

Fig 3: Which of the following technologies is best for improving or reinforcing your knowledge and skills in mathematics?

Qualitative:

Observations were held over 3 weeks long; they were divided between two groups. Group A had 7th and 9th grades that have been taught in a traditional way, and group B had another 7th and 9th grades that have been taught using technology inside the classroom. The observations focus on 3 major aspects which are students' motivation, participation and noise inside the classroom.

Group A observations:

Students in group A usually didn't show any interest in the given materials. At the beginning of the class, they mostly participated most of the time and had good motivation. But as the lesson time passed on, they started to lose interest and motivation which affected the classroom environment and some noise started to appear. Classes which were taught the traditional way started in a good way but the majority of them were starting to lose interest at 20 minutes and above.

Group B observation

Group B observations were a lot different, because students in group B were more energetic, participated a lot and were focused. Moreover, weak students showed interest in the given lessons because the materials were simpler by using visual aids and videos. Therefore, by pulling these students to the lesson they disturb and talk less. Thus, the classroom environment was fantastic and there was minimum noise inside the classroom.

Data Analysis

There is no doubt that Technology plays a major and irreplaceable role in the 21th century education. Every modern school and educator must take in consideration that education these days demands the use of technology, our students are bound to it and consider technology their second school, they can learn and acquire information so easily that it can even sometimes replace the teacher. Therefore, the use of technology is a need in our school to keep along with the twenty first century demands.

This is clearly seen by the results of the questionnaire, where the highest percentage of the given sample stated that they use technology to enrich and improve their Mathematical skills. 52% of the students stated that they use computer software for learning Mathematics where 61% said that they use social networking and 45% stated that they try to enhance their Mathematical skills by surfing online video websites such as YouTube. In addition, 41% of students said that they use smartphone and laptops apps to practice Mathematics.

Handley (2008) observed that a subgroup of students who were previously on the verge of dropping out develop the desire and skills to become self-directed, cognitively active, and performance-enhanced students who are more likely to become responsible and successful members of society.

Technology can have a huge impact on students' motivation. In our given questionnaire 85% of the students stated that they enjoy using technology while learning Mathematics, 70% stated that they know that technology can help them improve their Mathematics learning. 72% stated that they improve their abilities to resolve tasks by using apps, moreover 79% preferred using technology to enhance their skills. 87% think that watching videos and movies can enrich their knowledge compared to the traditional way. 54% like to learn Mathematics through online websites. What strengthens these findings is that only 19% of the students think that using technology in mastering Mathematics is not necessary.

As for the observations, the results were not different from those. And in fact it strengthens these findings above. Using technology inside the classroom can boost students 'motivation because students found material-rich classes specially for weak students where they can rely on pictures and visual aids for answering. Which can improve their self-esteem and raise their self-confidence. As a result, there was a positive classroom environment with little noise and disturbance.

Conclusion

Technology is omnipresent, and it is thoroughly incorporated into most students' daily lives, providing them with access to an enormous amount of data (Egbert, 2009). When this technology is used correctly in the classroom, it can assist students and teachers of all ability levels achieve higher academic accomplishment (Courville, 2011). Although there is a need for technological integration, many schools have failed to implement this critical intervention (Bolkan, 2012).

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