



Teaching and Learning Mathematics Online

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Abstract:

Teaching and learning mathematics online is a modern method used by both student and teachers because of the availability of technology. Some researchers found that this is an easy and enjoyable way to learn, but others see the opposite. In this research, will study the impact of teaching and learning mathematics online on the master`s degree student at Central Michigan University by using the following methods:

1. Answering the online survey questions after writing their genders, ages, and nationalities.
2. After studying the answers, the result came with both students and teachers prefer teaching and learning mathematics in classrooms rather than using the internet.

Keywords: *mathematics online, students, teachers, teaching, learning.*



Introduction

Mathematics is the science that goes into all aspects of life. Every day, we have to use math in groceries during paying the money or during learning process in the schools. Also, mathematics has linked with other courses such as physics, chemistry, and biology. Thus, we can call it as daily mathematics. Mathematics has many sections such as pure and applied mathematics that require us brainstorming, focus, and understanding during solving mathematical problems. Mathematics depends on bases, foundations, theories, and certain steps to solve its issues. Therefore, teachers always are looking for an easy and clear way to teach mathematics and deliver the information to the students.

However, teachers and students are facing difficulties because of the complexity of solving mathematical problems, but they can take advantage of existing technology these days to help them solving these complications. For example, the Internet can help them practicing doing math processes to develop their experience quickly and funny way. Previous researchers noted that there is “WebMa” that helps students practicing mathematics online to improve their skills and achievement (Nguyen & Kulm, 2005, p. 2). In addition, other researchers found that there is also an online program “ITM” that asks teachers practicing teaching math online to set up a math database and then share the basic ideas together (Namukasa & Gadanidis, 2011, p. 321). Likewise, other researchers stated that there is a program “Elluminate Live!” that has tutoring online “e-tutorials” to teach students mathematics online because it has a “communication tool” that makes learning process very easy for students (Mestel, Williams, Lowe, & Arrowsmith, 2011, p. 12). There are “Google Talk and Gmail account” for students for easy downloads and collection of the information (Edwards, 2012, p. 246). These programs and websites in the Internet help students and teachers doing complicated math process and theorems and make it enjoyable.



Also, using the Internet in the classroom and during the educational course transforms the classrooms to be technological (Edwards, 2012, p. 244). For instance, teachers can use electronic samples in some websites to show their students. Also, they use the calculator in the computer to make quickly math operations.

However, although the Internet has a lot of websites that help students and teachers learning and teaching mathematics online, there are some obstacles that make this process difficult and inappropriate for all students. According to Mestel et al. (2011) “ students audio experience varied greatly and, in fact, from fig 11, it is clear that sounds problems formed the largest number of issue raised by students during the trial” (p. 16). Other impediment was the “ whiteboard” that becomes messy during teaching process (Mestel et al. 2011, p. 16). Also, there are connection problems that prevent completing learning and teaching process. According to Nguyen and Kulm, (2005) “ some technical problems such as slow modem speed, slow bandwidth, or network jam may need to be allowed for the use of the web-based tool” (p.3).

Likewise, some researchers have show that some online programs like “Elluminate Live!” to teach and learn math online don’t fit with the disabilities students because they found “Elluminate Live!” difficult for adoption on the camera and audio (Mestel et al. 2011, p. 15). In most situations, however, learning mathematics online is helpful for students because it makes them raise the educational levels by more practicing, easy communication between students and teachers, and sharing the information. Thus, there are benefits for students and teachers of using the Internet to improve students and teachers skills.

Although previous researchers have examined the impact of using the Internet to improve the mathematical skills of students, researchers have not yet found big samples that cover students of different levels starting from kindergarten to PhD students. Researchers focused on the middle school students or kindergarten students without doing a research that covers students of all levels.



With this in mind, the target students in my current research are mathematics Master`s degree students in Central Michigan University because they are both students and teachers at the same time. My research questions have two parts: In the first part, I will ask them as teachers if they have any experience in teaching mathematics online. In case of positive answer, I will then ask them what kind of website they use. I will use the following questions: What are the benefits that they have? What are the obstacles and difficulties they are facing? In the second part, I will ask them as students. For example, my questions will be: Have you ever turned for help to online tutoring for learning mathematics? What are the benefits of online tutoring? What are the obstacles? What do you prefer more: learning math in the classroom or by using the Internet? I am planning to ask from 10 to 20 students to be sure about the result. After that I will analyze the result to find the relationship between using the Internet and improving the students and teachers skills. Also, I want to know if students and teachers have some ideas about using modern technology and helping them solve mathematical problems.



Method

In this section, I am describing a study that relate to teaching and learning mathematics online by using different websites to help teachers and students improving their skills. To find the best strategy, I chose the Graduate assistants, students and teacher together, in math department at Central Michigan University in Mount Pleasant to answer the survey questions. Participants should write their genders, ages, and their nationalities. After that, they will answer an online five close-ended survey questions, multiple questions, as teachers. Then, they will answer other five close-ended questions, multiple questions, as students to rate the using of the Internet to help students and teachers in solving mathematics problems. In addition, this process helps me to rate the improving of the students and teachers skills during doing math process by math websites.

Participants:

The participants were 14 people that they are grad assistant students in mathematics department at Central Michigan University, 9 male and 5 female. All the participants have the age between 25 to 40 years old. Some of them are Jordanian, or American. There is just one participant who is Russian. From these participants, there are 3 teachers (20%) whose have an experience in teaching mathematics online. Also, there are 4 students (27%) who are turned for help to online tutoring for learning mathematics online.

Data Collection:

The reconnaissance for this research was to find the relationship between using the Internet to improve the participant skills and to reveal the benefit and the obstacles for both teachers and students. Likewise, the reconnaissance was to evaluation of effectiveness of teaching and learning mathematics process by using the Internet. In addition, we need to know that if the participants prefer teaching or studying mathematics online or in the classroom.



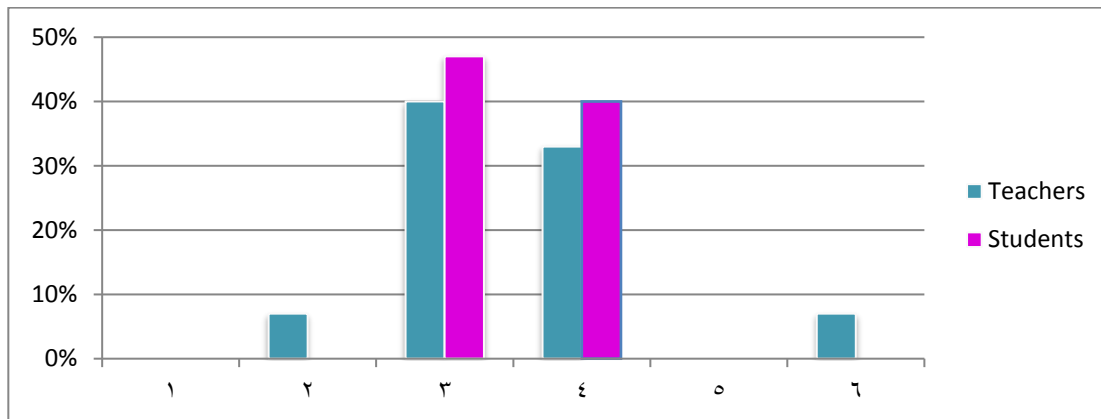
Results

The Experience and The Evaluation of The Effectiveness Based on Teachers and

Students:

In this part, I catch the idea that is students and teachers were using the Internet to help them understanding the difficulties during learning math process and to improve their skills because they had experiences (students: 27%, 4 students) and (teachers: 20%, 3 teachers), but the students were always asking the help from the Internet more than teachers. In addition, the students were seeing that this way is more effectiveness more then teachers. Table 1 is clarify the evaluation of the effectiveness of learning and teaching mathematics online for both teachers and students.

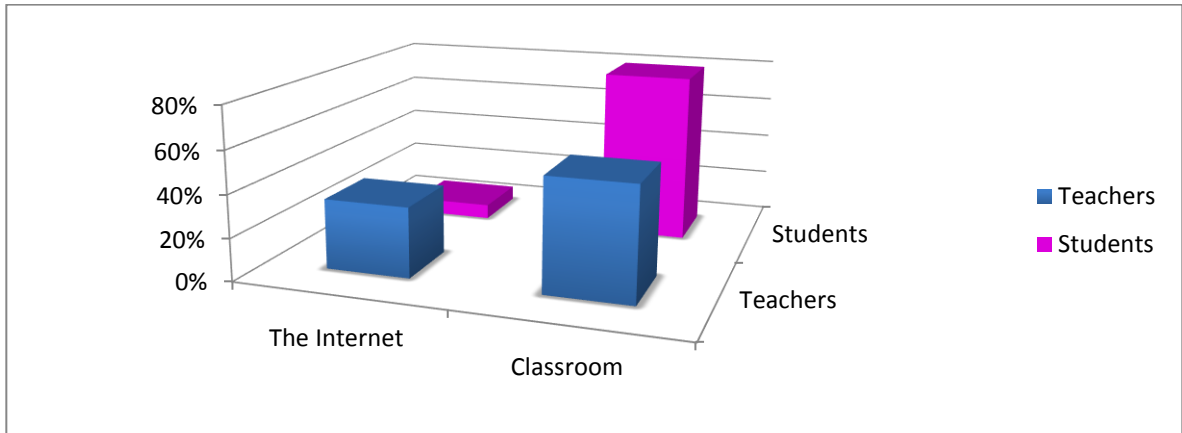
Table1: The evaluation of the effectiveness of learning and teaching mathematics online for both teachers and students.



Although they both had the experiences but the percentage of using the Internet to help them learning and teaching mathematics online is very low because they preferred studying and teaching mathematics inside the classroom instead of using the internet. Table 2 compares between the percentage of preferring learning and teaching mathematics inside the classroom or by using the Internet.



Table 2: compare between learning and teaching mathematics online or inside the classroom.



The Benefits of Using the Internet During Teaching and Learning Mathematics

Process:

As teachers, they had the benefits of increasing monthly income (33%, 5 teachers) with other benefits like relaxing and comfortable way (40%, 6 teachers). On the other hand, students had the benefits of reviewing videos at any time (60%, 9 students) just without any other benefits. For these a few benefits, they both preferred learning and teaching mathematics inside of the classroom for more benefits than using the Internet.

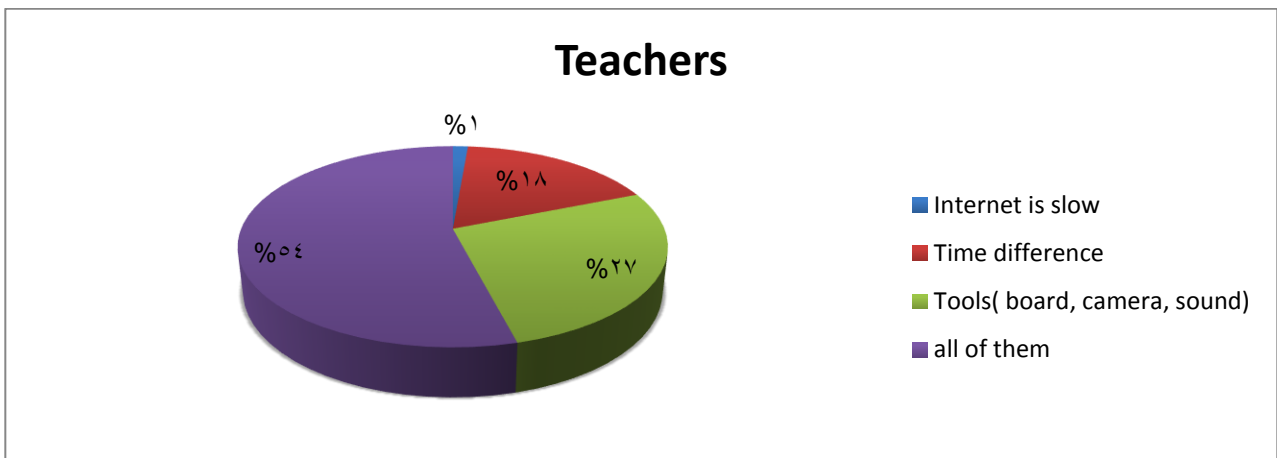


The Obstacles of Using the Internet During Teaching and Learning Mathematics

Process:

Teachers and students were agree that the tools like camera, board, and the sound are the main important issue that are facing during learning and teaching math online (teachers: 20%, students: 27%). Students didn't see other difficulties whereas there was other obstacle that prevented teacher doing that such as time difference (13%). Likewise, all the teacher participants (40%) agreed that the Internet characteristics, time difference, and the tools were making teaching mathematics online so difficult for them. Table 3 shows the percentage of each part of the obstacles for teachers.

Table 3: The percentage of each part of the obstacles for teachers





Discussion

This study resulted that teachers and students had the ideas of using and asking the help form the internet, but they were preferring learning and teaching mathematics inside the classroom because of that using the internet during teaching and learning mathematics process had some obstacles that prevented completing process. This result worked with the previous researcher by Nguyen and Kulm, (2005) “ some technical problems such as slow modem speed, slow bandwidth, or network jam may need to be allowed for the use of the web-based tool” (p.3). This result was real and realistic because there were many different countries that had problems with the Internet such as Internet speed.

This study also found that using the Internet to teach and learn mathematics online is not a good way to improve students and teachers skills because they like practicing inside the classroom and asking help from each other. This result did not fit with previous researchers such as “WebMa” that helps students practicing mathematics online to improve their skills and achievement (Nguyen & Kulm, 2005, p.2). This result was reliable also because not all mathematics websites can develop students and teachers skills for many reasons: the difficult of use, commensurate with the particular category of students, or it does not fit with teacher skills.

Limitation and future studies

The numbers of participants were 14 (9 male and 5 female) this number of participants were not enough in this study. In the future, other research will cover the big participants to make the results more realistic. Also, we need to find an online collage to teach mathematics online for students in whole levels starting from kindergarten until the college students. In addition, this college will teach the students how they can do the aptitude test for secondary students and the university students. Likewise, this college will take the responsibility to improve teacher skills by more practicing and sharing math information with each other.



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