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# Integrating Social Media and Math Teaching in High Schools

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**Abstract:** My topic is about integrating social media with math teaching in high school. I chose this topic because of the spread of using social media among teenagers who find it an interesting method. In this research I have evaluated the risks and benefits of using social media in education with the concentration on the best practices of using it in math teaching. I also searched for the barriers and obstacles of using social media in teaching math, and tried to find answers and solutions.

I also highlighted the social media tool that will be used as an example of technology application into ninth grade math instruction, which is Edmodo application, the easy way to help students collaborate, organize and have access to the past and current assignments, grades, and school messages.

**Keywords:** Edmodo, social media applications, anonymous, Web 2.0, Instagram.

## INTRODUCTION

### Background

Five years ago, when I was working as student advisor at a Saudi Arabian high school, I tried to communicate frequently with my students to help them with their emotional and educational problems and school issues. At that time, I realized that many girls got shy of telling about their problems. Some of them demonstrated social phobia. They felt scared and started stuttering when speaking about the problem. One day a girl came to my office asking me if she could write her problem on a piece of paper and send it to me. I welcomed her idea because I always wanted my students to feel comfortable and reassured.

I wanted to be a good helper all the time, and let my students reach me at any time of the day. After the incident with this student, I started a more helpful idea: Using e-mails to communicate with my students. It was an effective method for most girls who did not feel comfortable to talk to me face to face.

After practicing this for a period of time, I noticed many common stories and questions among my students. I started to discuss the effective solutions to these problems with my students. Then I asked the parents if I could post the questions and problems on one of the social media websites so the girls could find the answers and analyze their questions among themselves or with me. I got the approval from the parents, the students, and the school administration. Then, I built a simple web2.0 website where students could post their problems and the suggested answers, but they needed to use a password to get into the website.

My students posted many problems and got some answers. They liked the social network for several reasons. It helped them get the appropriate solution that made them happy. They could send and receive any post at any time even if it was in the middle of the night. That story led me to thinking and planning using social media and smartphones in teaching, especially in teaching math, which is my primary major, for high school students in Saudi Arabia.

My topic is about integrating social media with math teaching in high school. Social media has been defined in many references, however it is still a relatively new term. The Merriam-Webster dictionary states that first known use of the term "social media" was in 2004. It defines social media as "forms of electronic communication (as Web sites for social networking and microblogging) through which users create online communities to share information, ideas, personal messages, and other content (as videos)" (Merriam-Webster, 2014, para.1).

I chose this topic because of the spread of using social media among teenagers who find it an interesting method. Many researchers believe that social media is an interesting and engaging tool for teenagers in their education (Ahn et al., 2012; Casey, 2013). Also, social media applications and websites are used in instructions to search about specific information by hashtags that are always defined with the symbol #. As in Twitter website "People used the hashtag symbol # before a relevant keyword or phrase (no spaces) in their tweet to categorize those tweets and help them show more easily in twitter search" (para. 1).

When I searched online about using social media to teach math, I found that many researchers have conducted their studies effectively. There are researchers and professionals, who have started to evaluate the risks and benefits of using social media in education, but there remains a need for research on the best practices of using it in math teaching.

These research studies have explained the benefits of using social media; one of the benefits is the great amount of information they could gain by communicating socially with other professionals, students and also with people outside the academic field. Joosten (2012) noted that social media could affect students' learning positively, when it is used effectively and accurately.

While researching, I found some barriers of using social media in teaching math. One of them was the awkwardness of understanding the social media among the educators or students. Many applications need some instruction to be understood, and not all the teachers and students have the ability to figure it out. Another obstacle, is lack of a way to analyze the content by using social media applications besides just reading and drawing general decisions, that leads the educators to communication avoidance by social media. Additionally, social media is a world of anonymous users; student may not feel safe by using it, they might face some bullying from other unknown users.

By investigating this topic, I found that social media is an important tool in this century. Almost half of adolescents today are using social media every day. Beck (2014) noted, "A survey of 7,200 U.S. students reports only 45% of teens use the social network. Instagram is at 76% and Twitter 59%" (para. 1).

**Statement of the Area of Focus:**

The purpose of this project is to identify the possibility of integrating social media applications into math instruction in Saudi Arabian high schools. This project is to research into recent studies to get more information about the benefits and barriers of integrating social media into math instruction.

A large number of people use social media like Instagram and Twitter, and it could be an effective and educational way to deliver information.

**Research Questions:**

1- What is Social Media?
2- What are the benefits and advantages of social media?
3- What is the best practice of integrating social media into math instruction?
4- What are challenges when integrating social media into math instruction?

**Possible Limitations:**

There are several limitations that could reduce effective integration of social media applications into math instruction. One of them is the resistance to change by some educators and their point of view about this new method. Moreover, teachers' skills and ability in developing and organizing social media sites can be a concern. If a teacher does not possess the skills, teacher training is required. Another challenge is the life cycle of social media. There are numerous examples of online organizations that have been incredibly popular, but some showed a decline in use once something 'better' came along.

**Definition of Terminology:**

**1- Web 2.0:**

It is a second generation in the development of the World Wide Web, conceived as a combination of concepts, trends, that focus on user collaboration, sharing of user-generated content (dictionary.com, 2014)

**2- Instagram:**

It is an online mobile photo-sharing, video-sharing and social networking service that enables its users to take pictures and videos, and share them on a variety of social networking platforms (Wikipedia, 2014)

**3- Twitter:**

Twitter is an information network made up of 140-character messages called Tweets. It's an easy way to discover the latest news related to subjects you care about (Twitter help center, 2014)

**4- Edmodo:**

It is a "social learning platform" website for teachers, students, and parents. It is marketed as the Facebook for schools (Wikipedia, 2014)

## Definition of Social Media and Its Application

**What is social media?**

Social media has been described in various definitions. The Merriam-Webster dictionary stated that first known use of the phrase "social media" occurred in 2004. It defined social media as "forms of electronic communication (as Web sites for social networking and micro-blogging) through which users create online communities to share information, ideas, personal messages, and other content (as videos)" (Merriam-Webster, 2014, para.1). Another definition that is more technical is that "Social Media is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0. And that allows the creation and exchange of user-generated content" (Kaplan & Haenlein, 2009, p. 61).

In addition, this type of communication online had been used even before the appearance of the phrase "social media." Kaplan and Haenlein (2009) noted that Tom Truscott and Jim Ellis generated the first online post messages in 1979 that allowed users to communicate worldwide.

**Web 2.0 and SIS including Twitter and Instagram:**

Web 2.0 is an electronic programming tool that prompts discussion and critical thinking. O'Reilly (2005) mentioned that web 2.0 refers to an active web site that is based on applications, focused on social content output and sharing. For instance, Web 2.0 comprises many famous websites and applications, the most popular of which are Twitter and Instagram.

Twitter started on March 21, 2006 and it is a micro-blogging assistance that allows users to broadcast short paragraph of information called tweets (Picard, 2011). Twitter allows users to connect to (follow) stories, people, news, and opinions that they find interesting (Twitter, 2014). The next most popular social media application is Instagram; "it is a bit of fun and easy way to share someone's life with friends through a series of pictures and videos" (Instagram, 2014, para. 2).

**Social media and education**

"Many students today have appropriate skillfulness that enables them to design, connect, and establish collaboration in learning process. Furthermore, Web 2.0 tools like social media sites and applications now form how young people communicate, socialize, and learn" (Ahn, 2011, p. 1441). In addition, Vanwynsberghe and Verdegem (2013) emphasized, "Many scholars stress that educators and related professions have a particular responsibility in teaching young people how to deal with new media including social media" (p. 3).

The massive growth of social media use among students, and specifically social networking applications and sites like Twitter, truly shows that we are naturally social creatures, and education fields are affected by social media.

**Mobile device revolution**

A recent study by Alarabia (2014) showed that the prevalence of mobile communication services, among Saudi people, has increased about 169.3% per person. That is a huge revolution that leads many to researching on how social media is affecting people. Cell phones and mobile devices allow the adolescence's usage of social media and communication online (Ahn, Bivona, & DiScala, 2012).

**The Benefits and Advantages of Integrating Social Media into Education**

Teenagers today have been born in the era of technology and they are living in what is called the digital age. "Internet access is ubiquitous for teenagers in the United States (U.S.), with approximately 93% reporting regular access" (Ahn et al., 2012, p. 1). According to Joosten (2012), "85.2% of students overall with 95.1% of 18- and 19 -year-olds use social media" (p. 402). Previous research has proved that the vast spread of social media usage has been among adolescents. In a study by O'Keeffe and Clarke-Pearson (2011), they agreed "22% of teenagers log on to their favorite social media site more than ten times a day. And more than half of adolescents log on to a social media site more than once a day" (p. 800).

**Social media as an interesting and engaging tool**

Social media applications and students' participation can happen any time of the day. It is very adjustable and allows people to choose their preferred time to participate, not just when a meeting is scheduled. Also, Kelm (2011) asserted that students achieve better performance when they are in a social environment. According to the U.S. Department of Education (2009), "The meta-analysis found that, on average, students in online learning conditions performed modestly better than those receiving face-to-face instruction" (p. ix).

**Social media applications facilitating learning**

Social media websites and applications require little, if any, experience of online coding or design. Moreover, search methods within social media applications are easy to use through the use of hashtags. According to Twitter (2014), "The # symbol, called a hashtag, is used to mark keywords or topics in a Tweet. It was created originally by Twitter users as a way to categorize messages" (para. 1). In the same way, Joosten (2012) believed "by reviewing the dialog or sharing information using the conference hashtag, potential colleagues with whom to connect can be identified. This process can work even if you are not attending the conference" (p. 667).

**The Best Practice of Integrating Social Media with Math Instruction Communicating through smartphones and tablets**

Social media applications on the smartphones and tablets allow students and teachers to learn collaboratively with each other and it also gives the possibility to chat to peers at any time. This increases one's learning and connections because it is not just about sitting in a class with classmates talking to each other, and it is not about teachers who are seeing each other once a year at conference, it is a continuous connection all the time. Ahn, Bivona, and DiScala (2012) emphasized in their study that learning beyond the school walls has been shown to improve the learning process. Math teachers may use social media in problem solving by connecting it to the real life. Casey (2013) asserted, "this use of social media allowed me to assist students in connecting mathematical concepts with real life mathematics. And using visual clues to strengthen their understanding and meaning making, all of which supported their literacy practices" (p. 67).

Nowadays most of the students have their own devices, such as smart phones. In a study by Interactive (2013), Pearson school tried to know how its students could use their electronic devices in the classroom to gain more knowledge and get better education, also, how these students used their smart phones in their education. A survey was conducted to look for the current and future usage of mobile devices and tablets in elementary, middle, and high schools. It also monitored students' manner when using electronic devices in instruction.

The researcher conducted this survey online, and the subjects in this study were 2,350 students from elementary, middle, and high schools in the United States.

Here is a brief summary of the findings. Elementary and middle school students believed in significant use of electronic devices to raise their educational achievement. Most of the students nowadays own a tablet or a smartphone, and the older students most likely to own a smartphone than the younger ones. One-third of the students use their devices to do homework or conduct a research, or reading digital textbooks.

The survey asked about what kind of mobile devices student use and the purpose of owning an electronic device. The researcher found that about half of the students used the smartphones most often. Elementary and middle school students preferred the small tablets, but high school students tended to have a full-size tablet. Moreover, 56% of high school students own a smartphone while 42% of middle school students and 19% of elementary students did.

The overall results show that students would like to use smartphones and tablets to do research and homework, and they prefer the full-size tablet than the small one.

**Using Edmodo to form secure social groups:**

Students can gain great results when they study math in collaborative groups. "Today, with Web sites like Flicker, MySpace, and Facebook, and digital devices like mobile phones, it is easier than ever to form and join groups, even for quite short-term purposes" (Gee, 2010, p. 35). Edmodo is one of social media applications that provides secure groups. Joosten (2012) thought that students or teachers could find an appropriate group by using social media applications and smartphones like Edmodo.

A study was conducted by Batsila, Tsihouridis, and Vavougios (2013) to trace teachers' opinion after using Edmodo in their classes. The researchers used 41 junior high school teachers of various disciplines to answer a questionnaire in the research. The researchers asked about how frequently teachers used Edmodo, and what was teachers' opinion on its advantages and disadvantages. Teachers were given an enclosed envelope to return their questionnaire. A Likert scale was used to answer the questions.

The results of the questionnaires were not surprising. Half teachers used Edmodo three times a week and the rest of them used it once or twice a week. About motivating student, more than 60% of teachers found Edmodo more than great in motivation. In addition, Edmodo had a very large library that shows lessons and about 80% of the participating teachers found it very good, 40% of teachers also said Edmodo had a very good ability to assess learners. The participating teachers' answers showed that Edmodo was easy to use and they would like to recommend it to other colleagues because of its ability to motivate learners.

Learning math can be awkward to some students, and Edmodo provides online math groups to counteract this kind of students' feeling. Casey (2013) asserted that student from classes not in her classes interact with her math groups, which have been designed by math classes' students; many students got help from such groups.

**Impact of using Wikis in math classes:**

Wikis played an active role in education; many educators used it as a tool to improve their students' achievement.

Reich, Murnane, and Willett (2012) performed a study to explore the issues of brilliance, equity and analytics in the use of Wikis in the U.S. K-12 schools. The researchers chose K-12 students as a subject to examine their usage of Wiki online.

The study addressed two research questions: the first was about the kinds of learning opportunities that students had with Wikis, and the other was about the quality of Wikis, and if only certain students got the appropriate wiki's information for their age and grade or not. The researchers developed an instrument called WQI -Wiki Quality Instrument- to measure wikis values.

The data was collected from 225 U.S. schools. The researchers found Wikis was used in all academic subject areas and at all grade levels: 25% of the schools in grades K-5 supported Wiki's instruction, 28% in Grades 6–8, and 52% in Grades 9–12. Wikis was used not just in computer classes; it supported teaching in many subjects of the curriculum. The researchers summarized wiki quality and expanded its use in the U.S. schools. Researchers found that wikis was used to support instruction through the curriculum. For example, some used it in English/language arts instruction, and some in social studies, and the most used to support mathematics. They discovered 40% of wikis didn't serve useful purpose for students, and most of wikis were created by teachers. About 25% of wikis use was about individual student assignments, which didn't support collaboration. The researchers also found Wikis remain longer in wealthy schools, because most of them are not free.

Teachers used wikis to develop cooperation skills, technology skills, and critical thinking skills, also teachers need more training in setting up the Wikis and publishing it online. Wikis have to encourage collaboration, so teachers should do exercises that force students to discuss the lessons, and primarily edit each other's work. Wikis are successful and will be more effective when teachers work as peers, and share thoughts with other teachers.

As a result of the studies by Interactive (2013), and Reich, Murnane and Willett (2012), the researchers showed how frequently educators and students used technology in the classroom, and they displayed skill development that educators gain in the technological instruction. In Interactive study, students were interested in using smartphone or tablets in math and English art daily. Reich, Murnane, and Willett's study showed the real usage of Wikis online for K-12 students. Students preferred to use them through academic areas and at all grade levels. Both studies indicated that instructional technology need more work in collaboration, and that might be improved with the social media tools and applications.

## Challenges of Integrating Social Media in Math Instruction

**The awkwardness of understanding social media**

Educators may decline to use social media because they do not understand the program or how it works. Davis (2010) confirmed that teachers might face some barriers of using social media applications when they want to integrate it into their instruction.

Following this issue further, one of the biggest challenges for instructors is the difference in the communication style of social media versus the traditional in-class communication. Joosten (2012) agreed that educators need special training in using social media applications, and unfortunately many schools do not provide that.

**Safety in social media for students:**

Social media is a world of anonymous users; students may not be safe in their use of it; do they have their privacy settings set correctly? O'Keeffe and Clarke-Pearson (2011) insisted that the highest risk to children and teenagers online today is the risk of watching the ads in the applications that might lead them to the wrong products.

To treat that problem, programmers have designed websites that keeps the privacy of students and saves their information out of the reach from anyone not enrolled in their particular social group. For example, Edmodo is one of the social media applications that has a high privacy setting. "Social media sites such as Edmodo and Spyware may be safer options for students, since they are closed to individuals outside of class and allow teachers to closely monitor interactions" (Tomaszewski, 2012, p. 1).

**The costs of training :**

The need for high levels of filtering does carry an extra cost, and training teachers to deal with social media applications may require some funding. Denton and Wicks (2013) affirmed that even though social network applications are free, the user may have to pay for additional services that the application offers. For example, paying for file size uploads over the limitations or removing ads from the application can be costly.

Additionally, Tomaszewski (2012) insisted that each school principal should give his/her teachers the opportunity to get a proper education in how to use social media applications to facilitate learning process for the students. This training will require the school and the district for substantial cost and time.

**Topic of the Curriculum Unit**

I will highlight the social media tool that will be used as an example of technology application into ninth grade math instruction. This tool is the **Edmodo** application, an easy way to help students collaborate, organize and have access to the past and current assignments, grades, and school messages. This chapter will explain how it is going to be integrated into math instruction. In addition, this chapter will examine some of the advantages and disadvantages of using it, in order to determine if it is going to be a useful tool for students. Teaching materials, instructional strategies and related activities will be included in the discussion.

Cauley (2015) stated, "**Edmodo** is an educational website that takes the ideas of a social network and refines them and makes it appropriate for a classroom" (p. 1) For instance, **Edmodo** is mainly a free tool that is great to use for inside and outside of class communication. It can be installed on different devices such as cellphones, laptops, and iPads, and it offers several ways for teachers to connect with other teachers. Using **Edmodo** to build an online learning space and encourage conversation with my students inside and outside of math class is expected to be a positive addition to students' math learning.

**Edmodo** is the most secure social networking application and each **Edmodo** class group is managed and controlled by the teacher. Moreover, students need an access code to join the class, and they can communicate only to the class or to the teacher; private messages between students are not allowed. Furthermore, anonymous posting is not possible and teachers can delete inappropriate posts at any time.

**Contextual Culture of the School:**

This project will be implemented in a Saudi Arabian ninth grade class. According to the system in Saudi Arabia, girls are separated from boys in schools from the fourth grade, so this future class will consist of all girls at the ages of fourteen and fifteen. Mobile phones are not currently allowed on school campus/ in-class, so students will use computers to access the **Edmodo** website. Each student should have a computer and the opportunity to work on an independent computer. The class size ranges between 25 and 30 students.

A recent study by Alarabia (2014) showed that the prevalence of mobile communication devices, among Saudi people, is about 169.3% per person. That is a huge revolution, showing that every person in Saudi Arabia owns at least one or more mobile devices. All students will likely own at least one device, a cell phone or iPad which they can use to access **Edmodo** at home in order to complete the communication that was started in-class.

**Rationales for the Unit:**

This project will use the second unit of Saudi Arabian ninth grade math curriculum. The Ministry of Education in Saudi Arabia is the office that is responsible for the curriculum standards as well as textbook

adoption. All schools have the same exact textbooks all over the country. This unit is about equations, where students write, solve, and graph equations to model real world different situations.

Equations are very significant in the field of mathematics, because they are used in all areas of mathematics, as well as in other disciplines, solving them is an important foundational skill. In addition, formulas and equations deal with everyday things like shapes, investments, mixing ingredients, movement, and travel. They provide information anyone can use in planning activities, for example, to determine how much paint is needed to paint the walls in a house or how much gas will be needed for a trip to Seattle.

Using social media applications in math instruction is a new method that might be acceptable by parents and students or it may not. The best way to solve an equation problem is using colored tiles, and this is what all teachers and parents used to use. In this project, the **Edmodo** application will be used to show how to solve equation problems. According to many studies, teenagers today are more likely to use social media applications than a textbook. Joosten (2012) agreed, "85.2% of students overall with 95.1% of 18- and 19 -year-olds use social media" (p. 402).

Teaching math needs to be done in an enjoyable environment; many students think that it is fun to use technology while studying math. In the Interactive Study (2013, April 5) research, the researcher found that the majority of students think that tablets and smartphones would improve their achievement in the classroom because it makes the learning process more enjoyable. Furthermore, social media applications play a great role in students' achievement. Casey (2013) wrote that a social media math assignment plays numerous roles in helping students by strengthening many areas of literacy just by asking math questions and collaborating with others, then comparing answers with their peers.

Saudi Arabia uses the same textbooks that are used in many Washington State schools, and similar standards are required. Ozturk (2005) talked about current policies and practices around mathematics courses in high schools in the United States, his article highlights their use in general and advanced math courses, and what are the significant issues of studying them. The most important part in that article is a comprehensive explanation of current policies and practices in advanced mathematics courses. It discussed the graduation requirements and course offerings in an average high school's mathematics course.

The curriculum differentiation approach in the American high schools is intended to let the student graduate academically ready for their future jobs or education. In the same way, math courses are all compulsory in Saudi Arabia through the tenth grade, and then it is an elective course for the last two years of high school. In the future, many high schools students in Saudi Arabia will enroll and get into many majors at the university that need math knowledge. Thus math instruction they had from their previous high school studies would be vital.

One main goal and several related objectives were created to lead this curriculum project. The goal of this project was to explore and evaluate integration of social media as a tool in math instruction in Saudi Arabian high schools. To accomplish this goal, the following objectives were developed:

1. SWBAT solve one-step equations in one variable by using addition or subtraction on their computers or devices.
2. SWBAT solve one-step equations with one variable using multiplication or division with their computer or devices.
3. SWBAT solve equations with one variable that contain more than one operation by using **Edmodo**.
4. SWBAT solve equations with one variable that contain variable terms on both sides accurately.
5. SWBAT solve an equation with two or more variables and for one of the variables by using the computer with 80% accuracy.

The following objectives were based on Washington State Common Core standards which is exactly similar to Saudi Arabian standards, and the following table shows the alignment (see Table 1):

**Table 1. WA State Common Core Standards and Objectives**

| Objective | WA State Common Core Standards |
|---|---|
| **SWBAT solve one-step equations in one variable by using addition or subtraction in their computers or devices.** | **Create equations and inequalities with one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions (A-CED1).** |
| **SWBAT solve one-step equations in one variable by using multiplication or division with their phones.** | **Solve simple rational and radical equations with one variable, and give examples showing how extraneous solutions may arise (A-REI2).** |
| **SWBAT solve equations in one variable that contain more than one operation by using Edmodo.** | **Solve rational and radical equations with one variable, and give examples using Edmodo (A-REI3).** |
| **SWBAT solve equations in one variable that contain variable terms on both sides accurately** | **Solve rational and radical equations in one variable, and give examples (A-REI4).** |
| **SWBAT solve an equation in two or more variables for one of the variables by using computer at 80% accuracy.** | **Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales (A-CED2).** |

**Resources:**

This unit will use Saudi Arabian textbooks that are provided free for every student from the Ministry of Education; each student will have her own book. The concentration will be on **Edmodo** to meet math standards, so each student will work on a computer during the math class, and they will work on their own devices at home, whether cellphones or tablets.

**Instructional Strategies and Activities:**

This project uses several instructional strategies to help students who are struggling with mathematics by choosing an appropriate time and strategy for the intervention. The more different instructional strategies incorporated into the lessons, the more likely a teacher will be able to reach all of students, regardless of any math issues they may have.

At the beginning of the unit, students will sit in front of the computers and sign up for a new account on **Edmodo,** then they will be given the class code to login to the **Edmodo** class. At this step of the learning process will be using a student pairs strategy, having students work in student pairs is a beneficial instructional strategy, particularly for struggling students. Students who need help may be unconfident about their abilities and thus feel unmotivated. Student pairs can be less frightening for struggling students. It may be more comfortable to ask questions and acknowledge awkwardness when working with another student. Additionally, teaching math helps reinforce the lessons so the more advanced student will also benefit from student pairs.

After setting up an account, students will receive the expected lesson objectives because knowing the objectives give students advanced information about each lesson, which has been shown to improve learning. A quick warm-up activity will be carried out at the beginning of each lesson; the use of quick warm-up activities in class can be beneficial for several reasons. One, warm-up activities get students to begin thinking and focusing on math concepts. It may have been a few days since they last attended math class. Another reason is that students may get lazy at the beginning of the lesson and doing a fun activity will raise their energy levels.

For warm-up activities in each lesson, there will be a different simple game from the **Edmodo** activities library, which contains of thousands of math activities. Students will use computers individually when they are working to solve the problems for each activity.

After that, students will see a posting for the first concept of the unit; solving equations by adding or subtracting. Students will remain in their positions and the teacher will use direct instruction. Jacobsen, Eggen, and Kauchak (2009) mentioned that direct instruction is appropriate for learning specific concepts or skills. In

addition, direct instruction plays an important role in lessons that emphasize on higher-level thinking, which cannot occur without having basic facts and content information.

The students will be given the exact concept or skill that they will be learning during the lesson and then they will be guided through the instructional activities designed to have a positive impact on their learning. In learning math concepts, a cooperative learning strategy will be used. Banks stated, "Cooperative learning strategies are specifically designed to encourage students to work together and help each other learn common goals. Because of this, they have been found to be successful in not only learning content but also fostering positive intergroup attitudes in diverse and multicultural classrooms" (as cited in Jacobsen, Eggen, & Kauchak, 2009, p. 262).

Cooperative learning teaches students to deal with diversity; students learn to work with all types of team members during small-group interactions. Small groups also allow students to add their viewpoints to an issue based on their cultural differentiations. Nobody denies the fact that this exchange helps students to better understand other cultures and perspectives, whether in math or any other class.

Students will be arranged into small groups. Each group will contain of four students. They are going to discuss the first exercise that is posted on **Edmodo**, and when they reached the correct answer as a group, they will post it to **Edmodo**. After that, two groups will be pot together to share their answers with each other. By the end of the class, students will go back to their own seats to login to their individual account in **Edmodo**. At that time I will post an instructional game that refers to the lesson, and the students will receive it and play it individually.

**Assessment Plan:**

In my classroom, I always strive to assess what my students understand by making a daily checklist of all lessons' concepts, so I could know if they got the correct understanding of the concepts. I want to know more than just whether or not the student can circle the correct letter. I want to know how well my students can think progressively and connect new topics to the prior knowledge. Most math teachers will agree that daily assessment is essential to both how we teach and what we teach, and is more valuable than data received from a summative multiple-choice test.

I agree with the N.C.T.M. "Assessment Standards for School Mathematics". The standards state that math assessment should reflect the mathematics that all students need to know and be able to do. For that I will make a holistic scoring rubric and include samples of students' work on a handout so my students will know what they are expected and how they are going to be scored (see Table 2). By developing rubrics to score students' work on tasks from assessment standards, my students and I can both have a clear understanding about the mathematics concepts being taught and the mathematical goals of the instruction.

Summative assessments often focus on isolated content standards and fail to test students' daily skills while formative assessment is an effective way to ensure that students are developing their skills. That is why I prefer using formative assessment every day, with my students in my classroom, such as asking questions daily during the course of a lesson (see Table 3). I also will do summative assessment at the end of each unit, such as tests and quizzes that are based on assessment standards, which based on N.C.T.M. assessment standards "The National Council of Teachers of Mathematics"

In conclusion, math assessment should be done to measure students' work and cover all the assessment standards. Beyond that, assessment standards help teachers create measurements that offer more than just modest ways to score single students, districts, and states.

**Summative evaluation will be based on the following criteria:**

1. Completion of homework: 10 %
2. Grades by formative assessment by checklist: 30 %
3. Completion of in-class activities: 15 %
4. Unit test: 35 %
5. Grades by summative assessment by holistic rubric 20%

**Table 2. Unit Holistic Rubric Assessment**

| Objectives | Beginning 1 | Developed 2 | Accomplished 3 | Exemplary 4 |
|---|---|---|---|---|
| **The students will explain the steps to solving an equation with one variable on one side.** | Student has no understanding of the steps to solving equations and cannot put them in words. | Student does not show an adequate understanding of the steps to solving an equation and struggles putting them into words. | Student shows understanding of the steps to solving an equation and can put them into words. | Student shows understanding of the steps to solving an equation and can put them into words. |
| **The student will solve equations with variables on both sides of the equation.** | Student does not calculate the correct answers for equations. | Student does not adequately calculate the correct answers for equations | Student shows correct calculations for the answers to equations some/most of the time. | Student calculates correct answers for equations. |

| Objectives | Beginning 1 | Developed 2 | Accomplished 3 | Exemplary 4 |
|---|---|---|---|---|
| **The student will use Edmodo in solving equations** | Student does not show correct using of Edmodo to solve equations | Student does not adequately show correct using of Edmodo to solve equations | Student shows correct using of Edmodo to solve equations some/most of the time. | Student shows correct using of Edmodo to solve equations |

**Table 3. Unit Checklist Assessment**

| Developing Ideas | Yes | No |
|---|---|---|
| **1- Student signed in Edmodo** | | |
| **2- Student wrote a replay to a note in Edmodo** | | |
| **3- Student translated basic puzzles and word problems into algebraic equations.** | | |
| **4- Student could highlight key words and phrases to help them determine the correct functions.** | | |
| **5- Student solved one step equations** | | |
| **6- Student worked in whole group, small group, and individually** | | |
| **7- Student solved equation that can be solved by using the addition or subtraction property of equality in Edmodo** | | |
| **8- Student solved equation that can be solved by using the multiplication or division property of equality in Edmodo** | | |
| **9- Student created a multistep equation and post it in Edmodo** | | |

**Table 4. Unit Plan**

| DAY | Focus | Instructional strategy |
|---|---|---|
| **Day 1** | Solving equations by adding or subtracting | Direct instruction<br>Small groups by using Edmodo |
| **Day 2** | Solving equations by adding or subtracting | Problem solving by using Edmodo<br>Think-pair-share by using Edmodo |
| **Day 3** | Solving equations by multiplying or dividing | Direct instruction<br>Group work by using Edmodo |

| DAY | Focus | Instructional strategy |
|---|---|---|
| **Day 4** | Solving equations by multiplying or dividing | Discussion by using Edmodo<br>Think-pair-share by using Edmodo |
| **Day 5** | Solving two-step and multi-step equations | Guided discovery<br>Inquiry by using Edmodo |
| **Day 6** | Solving two-step and multi-step equations | Direct instruction<br>Think-pair-share by using Edmodo |
| **Day 7** | Solving two-step and multi-step equations | Problem solving by using Edmodo<br>Group work by using Edmodo |
| **Day 8** | Solving equations with variables on both sides | Guided discovery<br>Discussion by using Edmodo |
| **Day 9** | Solving equations with variables on both sides | Direct instruction<br>Small groups by using Edmodo |
| **Day 10** | Solving equations with variables on both sides | Problem solving by using Edmodo<br>Inquiry by using Edmodo |

**Predicted Implementation:**

My topic is about integrating social media into math teaching in high school. I have been teaching math in Saudi Arabian high schools for twelve years and I have used technology in my instruction several times. Typically, there were 25 students between the ages of fifteen and eighteen who learn in my classroom on a daily basis. Two times a week, we went to the computer lab to access online math lessons, for the lessons needing computers, and for each student to do math work independently. At other times students did group work in the classroom.

Students are smarter than we think. It is easier for the students to deal with technology as a normal tool, often easier than the adults around them, and the students love exploring it. This generation of students are called digital natives (Prensky, 2001) because they are much more adaptable to technology and social media applications; most of them use one or more social media applications on daily basis.

**The Challenges:**

Even though students like technology, especially social media applications, there are some challenges that schools and teachers face during the implementation of this project. Nobody denies that teaching in the age of information is exciting and challenging. I believe that integration of social media applications in every classroom is critical to my students' success, particularly helping them build 21st century skills. Social media

applications and sites are a new phenomenon in Saudi Arabian high schools and called "online social networking." In these environments, students register and establish profiles that ask for personal information and sometimes their personal photos. Then, students make connections with other online users who share interests or connections. Because of this aspect, it is possible for students to enter into harmful activities with other users, and that may cause some concerns for them.

Another challenge is that Edmodo lessons are all in English while math curriculum in Saudi Arabia is in Arabic, so students would not understand the lesson or the goal of any game. Moreover, parents often do not like significant changes in class methodology or curriculum, and Edmodo will be a new teaching method in Saudi Arabian high schools so teachers who want to implement it may face parental resistance.

**Strategies to Overcome the Challenges:**

Most educators are eager about the role that technology can play in improving students' learning and that is why I intend to find solutions to overcome the challenges of implementing this project. To overcome the concern about students' privacy, programmers have designed websites or applications (i.e. Edmodo) that maintain the privacy of students and can prevent their information from exposing to anyone who is not enrolled in their particular social group. "Social media sites such as Edmodo and Spyware may be safer options for students, since they are closed to individuals outside of class and allow teachers to closely monitor interactions" (Tomaszewski, 2012, p. 1).

The front page of Edmodo offers the show in many languages, one of them is Arabic, so teachers who don't know English would benefit from it. Lessons and games currently in Edmodo are not written in Arabic, but this is a great opportunity for teachers to develop Arabic lessons and add them to the library. Teachers will gain significantly technological skills in making lessons and they will benefit themselves and other teachers. Another challenge that can be overcome is the resistance of changes from parents. This must be done using social media applications that are easy and axiomatic to use by the majority of the users, especially those who are not digital natives. Parents can become a user and have access to the lessons. Their direct experience with the lesson may reduce this worry. Also, by showing how successful this method is in increasing students' learning and grades, teachers can convince parents that this change can produce positive outcomes.

Social media applications are amazing tools that enhance the learning process, but on the other hand, the way that some teachers integrate them with teaching can be wrong. Some teachers rely on them too much. Moreover, in my previous teaching, I saw that students really liked being able to accomplish a task using technology and worked harder at these tasks. I believe that the teacher should guide the students in the use of this technology, and then they should provide more advanced lessons, depending on his/her previous skills.

**What did I learn through this Project?**

When I first began studying for my master's degree in Instructional Media and Technology, I did not know much about American education. For example, I did not know about the differences in education, either by state law or state standards. During studying in the United States, I was able to share some of my ideas from my country with other students while giving them a clearer picture of education in Saudi Arabia.

Studying at Eastern Washington University (EWU) and taking classes for two years have helped me a lot in writing my project. I took technology classes that gave me a variety of different instructional tools and gained rationales for using them. I researched many different programs and chose the one that could be more beneficial when integrated with math teaching in Saudi Arabian high schools; that is Edmodo.

While writing this project, I have seen the data about the importance of using social media applications in education and what are the best ways to integrate it into teaching. I have found that the optimal uses of social media applications, those with the most benefits or advantages, are the ones that are integrated with in-class teaching.

Even if the teacher gives guidance at the beginning of the class, explaining the lesson and getting the application ready to use, before letting the students do their individual lesson, it is important for the teacher to remain watchful, circling the classroom and looking for frustration or questions. This ensures that the students get the most out of their lessons and improve learning and the learning process; as Project Red (2010) stated: "the execution is as important as vision" (p. iv) and it is the teachers' obligation to make sure the process of using technology is correct.

EWU has given me a great opportunity to analyze many studies, understanding the importance of the data and to get significant information about educational technology from professional teachers and researchers. I learned that the American education is affected by politics in the United States. Federal and state laws govern education and that can make either an organized educational environment or one that is not consistent. While educational laws are made by professionals, to better develop education in America, the data has shown that education varies depending on whether the school is in a rich part of town or if it is in the poor part. I learned that poverty plays a big part in the education system and that means that poor students may not have access to computers, educational technology or superior learning strategies or practices. I think that education should be equal for everyone. As Cole (2008) stated, "good instruction is good instruction, regardless of students' racial, ethnic, or socioeconomic backgrounds"

**The Effect of this Project on Learning:**

Dealing with technology, especially social media applications, has opened my eyes to a whole new method of teaching and has inspired me to constantly watch or search for new applications and better

teaching strategies. I used some applications during my study and I found that Edmodo contains most benefits students need. I will remain learning because a better tool may become available in the future and my students deserve the most modern and up-to-date education possible. Technology greatly improves education, it raises students' academic achievements, and inspires higher-level learning, but it requires an aware and adaptive teacher as well. We have to say thanks to technology because it is changing education quickly. I will work hard continuing to be connected with the great stuff at EWU and other educational networks that will help me to bring the best technology resources to my students.

Finally, learning should be fun and exciting! My classroom will be an attractive and safe place where children will feel comfortable integrating social media applications into the normal math lessons; the integration almost guarantees that their learning will be fun, exciting and very successful. The best education is one that "is at once more rigorous and more engaging, more collaborative and more inclusive" (ProjectRed, 2010, p. iv). As Fullan (2013) suggested, "the basic notion is of teachers and students as learning partners" (p. 23) and that will be a fundamental part of my classroom.

In conclusion, I have really benefited from my master's program. It has prepared me to be the most competent and interesting teacher that I can be. I will also be the teacher who regularly searches out for new successful educational technology, who uses research to back up my strategies as well as student achievement levels, and the teacher that always has my students' best interests in mind as I help prepare them for their future. Education in the 21st century is "about giving [students] the tools and techniques to teach themselves, both in school and beyond" (ProjectRed, 2010, p. iii).

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## دمج تطبيقات التواصل الاجتماعي مع تدريس الرياضيات للمرحلة الثانوية

**الملخص:** دمج تطبيقات التواصل الاجتماعي بالتعليم هي إحدى وسائل التعليم الحديثة والتي تناولت دراستها في رسالتي وقمت بتحليل محتواها عند تطبيقها على تدريس الرياضيات للصف الثالث متوسط. قمت باختيار موضوعي هذا نظراً لانتشار استخدام مثل هذه التطبيقات بين المراهقين والشباب الذين يجدون أوقاتاً ممتعةً بتصفحها. في دراستي هذه قمت بتقييم المخاطر والعقبات وأيضاً المميزات التي من الممكن أن تواجه أي معلم مستخدم لها، وأيضاً سلطت الضوء على أفضل استخدام لها عند تدريس الرياضيات مع طرح الحلول والإجابات لكل عقبة.

في دراستي قمت بالتركيز على أحد الأدوات الهامة في التواصل الاجتماعي التكنولوجي ألا وهو "تطبيق ادمودو" ، الذي سهل على الطلاب التواصل مع زملائهم والتعاون في حل المسائل وأيضا الوصول السريع للمهام والواجبات الدراسية الحالية والماضية.

**الكلمات المفتاحية:** إدمودو - تطبيقات التواصل الاجتماعي - مجهول - ويب ٢ - انستقرام .