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Effect of Social Networking in Teachings on Students Performance in Mathematics in the Federal College of Education Yola, Adamawa State, Nigeria

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ABSTRACT

The purpose of this study is to consider the effect of social media network tools like YouTube and Facebook in teaching mathematics. The study employs an experimental group design with control group. It was carried out in mathematics department of Federal College of Education, Yola. A sample of 96 mathematics students is used for the study. A 20 item multiple choice Mathematics Achievement Test (MAT) with reliability co-efficient of 0.76 utilized through Kuder Richardson method (KR_{20}) to collect data. The data were analyzed using mean and standard deviation to answer research questions while t-test statistics was used to test the hypothesis at 0.05 level of significance. The result of the study reveals that the use of social media network tools in teaching mathematics enhanced students' achievement. Based on the findings, it is recommended that social media network tools should be used by mathematics teacher in teaching mathematics at all levels of education.

Key words: *Social Media, Mathematics, YouTube and Facebook*

INTRODUCTION

Social media is the collective of online communications channels dedicated to community-based input, interaction, content-sharing and collaboration. Websites and applications dedicated to forums, microblogging, social networking, social bookmarking, social curation, and wikis are among the different types of social media. Some prominent examples of social media are:

- **Facebook** is a popular free social networking website that allows registered users to create profiles, upload photos and video, send messages and keep in touch with friends, family and colleagues.
- **Twitter** is a free microblogging service that allows registered members to broadcast short posts called tweets. Twitter members can broadcast tweets and follow other users' tweets by using multiple platforms and devices.

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- **Google+** (pronounced *Google plus*) was Google's social networking project, designed to replicate the way people interact offline more closely than is the case in other social networking services. This website is no longer offered to new users and plans to shut down remaining accounts in 2019.

- **Wikipedia** is a free, open content online encyclopedia created through the collaborative effort of a community of users known as 'Wikipedians'. Anyone registered on the site can create an article for publication; however, registration is not required to edit articles. Wikipedia was founded in January of 2001.

- **LinkedIn** is a social networking site designed specifically for the business community. The goal of the site is to allow registered members to establish and document networks of people they know and trust professionally.

- **Reddit** is a social news website and forum where stories are socially curated and promoted by site members. The site is composed of hundreds of sub-communities, known as "subreddits." Each subreddit has a specific topic such as technology, politics or music. Reddit site members, also known as, "redditors," submit content which is then voted upon by other members. The goal is to send well-regarded stories to the top of the site's main thread page.

- **Pinterest** is a social curation website for sharing and categorizing images found online. Pinterest requires brief descriptions but the main focus of the site is visual. Clicking on an image will take you to the original source. For example, clicking on a picture of a pair of shoes might redirect users to a purchasing site and an image of blueberry pancakes might redirect to the recipe.

According to Sharuna (2019), when it comes to social media and education, some parents and teachers view these platforms as distractions that negatively influence students. But in today's increasingly digital world, social media plays a meaningful role in higher education every day. When used the right way, social media can enhance a student's learning journey, also making it much easier for students and educators to connect. Researches have shown how beneficial social media can be in terms of learning. Through these various platforms, teachers can connect with students and incorporate social media into

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their lessons, making them more interesting, relatable and engaging. Social sites are a great tool when it comes to interacting with students since it's something they are so familiar with, using these sites frequently throughout daily life. Acciording to Richard and Latifah (2011), when students encountered problem in mathematics due to lack of self-confidence, an online pre-tutorial mathematics workshop was organized to teach them how to use the Microsoft Equation Editor software. They were also taught how to access video clips and PowerPoint slides posted in the blog, as some students were not well-versed enough in technology to effectively use these resources. Sharuna (2019) analyzed the use of social networks as a communication tool between teachers and students and found that they primarily communicate through social networks for academic reasons. The results of the study led researchers to conclude that teachers should use social networks as communication tools for purely academic-related issues, such as addressing aspects related to class organization and coursework. Teacher-student interaction in the social media sphere should be kept strictly professional.

Enagandula and Prasad (2014) defined Social Media is an interface between people who cannot be together actually but stay together virtually. Wide-ranging interactions between teachers and students and in general have always been part of the practice of teaching. The capacity to speak either face-to face or by phone, for example, is part of a scaffold learning experience offered by many teachers of day and distance students. The different here is the technology, and its implications for education. Many higher education institutions are discovering that new models of teaching and learning mathematics which are required to meet the needs of a generation of learners who seek greater freedom and connectivity as well opportunities for socio-experiential learning. In contrast to earlier e-learning approaches that simply replaced traditional models. It opportunities to move away from the last century's highly centralized, industrial model of learning and toward individual learner empowerment through designs that focus on collaborative, networked interaction.

Oblinger (2006) cited in Michelle (2014) points out that the characteristics of the 21st century youth are technologically inclined and have a high preference for active and participatory experiences of both face-to-face as well as online learning. This high preference for a participatory experience via the Web does not mean that the youth need to be online synchronously or be together physically. Rather, the youth or the students can be discussing, communicating and sharing information and knowledge synchronously or asynchronously using the various social media and networking applications at any time and at any location. Similarly, from the data, the students indicated that they liked the active

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participatory experiences of using the social media and social networking applications at any time and at any place. They liked to use YouTube for additional information and knowledge that can better prepare them for the real working world. They liked to use the social networking applications of Facebook to make friends and to network with friends and to have a good relationship and rapport with their lecturers, too. Through the connectivity, network and communication via Facebook, they can get to learn about information and knowledge informally at their own time and at their own preferred place beyond the boundaries of the textbook and the classroom.

Today's youth have much experience with video and photo-sharing media such as YouTube (Mullen and Wedwick, 2008). This video-sharing media can be incorporated into a constructivist classroom as learning tools as the youth; the students are actively creating their own learning experiences through viewing and creating videos and educators can use this as a tool for engaging the youth in meaningful learning experiences (Mullen and Wedwick, 2008). YouTube is increasingly being used by educators as a pedagogic resource for many interesting newsworthy events to teach students especially within an 'English as a Second Language' course, (Duffy, 2008). The students watched the videos as a resource towards learning the essentials of the English Language and the students get enjoyment from watching the videos.

The purpose of this research is to consider the effect of the use of social media tools such as YouTube and Facebook, in the teaching and learning of mathematics. The research will show how some selected students of mathematics department study using social media tools. The following questions are used to guide the research:

(i) What is the difference in mean achievement scores between students taught using social media as a tool of learning and those taught using the Traditional approach?

(ii) Is there any significant difference between Teaching/learning with the aid of social media tools and Teaching/Learning of mathematics using the Traditional approach?

(iii) To what extent do male and female students taught using social media tool approach differ in their mean achievement scores?

METHOD

This study is a quasi-experimental research design adopting the pre-test, post-test for both the experimental and control groups. A sample of 96 students was

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randomly selected from NCE1 (1st year), NCE2 (2nd year) and NCE3 (3rd year) of Mathematics department of Federal College of Education, Yola, in Adamawa State. The participants in the study were students of Mathematics Department in Federal College of Education, Yola with the following cause combinations: mathematics with computer science, mathematics with integrated science and mathematics with English language. The students were divided into two groups, one of the groups taught using the Traditional Teaching Approach **TTA** and the other group with the aid of Social Media Tools **SMT**. The control group was made up of 50 students (30 males and 20 females) while the experimental group comprises 46 students (25 males and 21 females).

The instrument used for the data collection was a 20 item multiple choice questionnaire Mathematics Achievement Test **MAT** constructed by the researcher and validated by mathematics educators and measurement and evaluation experts. The instrument had reliability coefficient of 0.76 determined using Kuder-Richardson methods (KR_{20}) showing that the instrument was reliable and acceptable for the study. The two groups were pre-tested to ensure that they are of the same cognitive background.

The experimental group was taught mathematics concepts on the topics: algebra, geometry and trigonometry. The test instruments were marked over 100%. The data generated was analyzed using mean and standard deviation to answer the research questions while t-test was used to test the significance at 0.05 levels.

RESULTS AND DISCUSSION

Table 1: Summary of Mean and Standard deviation for the students' achievements

Group	Test	N	Mean	Std Div.	Mean gain	Diff in mean
EXPT	Post-test	46	58.05	8.79	19.31	
	Pre-test	46	38.74	7.71		17.35
CTRL	Post-test	50	40.56	7.63	1.96	
	Pre-test	50	38.60	8.55		

Source: Quasi-experiment, 2019

Table 2: Summary of achievement of male and female in the Post achievement test in the experimental group

Gender	N	Mean	Std Div.	Diff. in Mean
Male	25	51.48	11.68	2.12
Female	21	49.36	11.26	

Source: Quasi-experiment, 2019

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Table 3: Summary of t-test analysis for Post-tests Scores for Social Media Tool **SMA** and Tradition Teaching Approach **TTA** at 0.05 significant level.

Group	**N**	**Mean**	**Std Div.**	$\mathbf{T_{cal}}$	$\mathbf{T_{tab}}$	**Decision**
SMA	46	58.05	8.79	7.953	2.56	**Rejected**
TTA	50	40.56	7.63			

Source: Quasi-experiment, 2019

Table 1 shows that the experimental group had a mean gain (that is; mean advantage) of 19.31 after treatment while the difference in mean between the two groups stood at 17.35 in favour of the experimental group. The mean difference in the control group between post-test and that of the pre-test is small as compared to that of the experimental group.

Table 2 shows that male students had mean achievement of 51.48 while the female counterparts had mean of 49.36. That is, the mean difference between male and female students is 2.12 in favour of the male counterparts. In table 3, the z-test analysis shows that the result of the calculated value (7.953) is greater than the critical value (2.560) at 0.05 level of significance, the null hypothesis that there is no significant difference between the mean achievement scores of students taught mathematics concept using social media tools **SMT** and those taught using the traditional teaching approach **TTA** is rejected. Therefore, there exist a significant difference between the students taught mathematics concept using social media tools **SMT** and those taught using the traditional teaching approach **TTA.** This result is in line with the findings of David and Stanley (2000) as cited in Unamba, Ugochukwu and Nwaebo (2015) who conducted on learning together technique. When the impact of Social Media Tool approach was compared with the Traditional approach, the effect was greater in favour of the Social Media Tool Approach meaning that the difference in performance was quite significant. This was found to be statistically significant in agreement with the findings of Nwoke (2015) which showed that students taught by the traditional method performed significantly too low**.**

Also the study showed that the mean gain in the achievement between male and female in the same experimental group, that is, the students taught using Social Media Tool was not statistically significant. This implies that the achievement gap between male and female of the same experimental group was drastically reduced with the use of social media approach.

CONCLUSION AND RECOMMENDATIONS

This study was conducted to examine the effect of social media tools approach

on student's achievement in mathematics. The results of the study reveal that the social media tools approach of teaching is more effective and there is no significant difference in mean scores achievement of male and female in using the social media tool approach. With the social media tool approach of teaching, the result reveals that there was improvement in the students achievement in mathematics and reduces the gap in mathematics achievement between male and female students taught using the social media tool. Hence, this study concludes that the use of social media tool is more effective compared to the traditional teaching method.

In the light of conclusion obtained in this study and results reached, the following recommendations were made:

1. Social media tools like you-tube, Facebook etc. should be used in teaching mathematics at all levels of learning as this will increase students' interest for better performance.
2. Mathematics laboratory should be designed and furnished with facilities that will enhance the use of social media tools for effective teaching and communications.
3. Conferences and seminars should be organized for mathematics teachers on the use of social media tools in teaching mathematics.
4. All the classrooms in educational institution from primary schools, secondary schools and higher institutions should be equipped with social media gargets to enhance effective teaching of mathematics.
5. The use of social media tools should be cooperated into the mathematics curriculum and the traditional teaching methods should be gradually phased out.

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Test Item Speciment Tables

Table 1: Content Selected for achievement test

1. Angles
2. Triangles
3. Quadrilateral
4. Circle
5. Algebra
6. Trigonometry

Table 2: Test Sample Specimens

		Number of items		**Content/unit**					
S/N	Instructional Objective	Angles	Triangles	Quadrilateral	Circle	Algebra	Trigonometry	Total	%
1	Knowledge	2	1			1		4	**20**
2	Understanding	1	2	1				4	**20**
3	Application		1	1	1	1	1	5	**25**
4	Skill	2	1	2	1		1	7	**35**
	Total	**5**	**5**	**4**	**2**	**2**	**2**	**20**	**100**

Table 3: Scoring Pattern of multiple choice question items

Item Type	Correct Responses	Wrong Responses
Multiple choice	1	0

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Table 4: Item Analysis – Discrimination index

Range	Grade	Recommendations
> 0.39	Excellent	Preserved
0.30 – 0.38	Good	Possibility for enhancement
0.20 – 0.29	Average	Need to verify/ review
0.00 – 0.19	Poor	Rejected or review in depth
< – 0.01	worst	Remove

Table 5: Distribution of discriminating index of items of first draft of achievement test

Range	Items	Total
> 0.39	1,2,4,6,9,10,11,14,16,17,20,24,29,30	14
0.30 – 0.38	3,7,19,25,26,28	6
0.20 – 0.29	5,23	2
0.00 – 0.19	8,15,21,22,27	5
< – 0.01	12,13,18	3
	Total	30

Table 6: Item Analysis final Try out draft

Level of difficulty	Medium (0.34 – 0.66)	Remark
Total		
> 0.39	1,2,4,6,9,10,11,14, 16,17,20,24,29,30	Excellent items - 14
0.30 – 0.38	3,7,19,25,26,28	Good items - 6
Total		20

Total 7: Number of items in the final draft of achievement test at different cognitive levels of objectives i.e. Knowledge, Understanding, Application and Skill.

Content/unit

S/N	Instructional Objectives	Angles	Triangles	Quadrilateral	Circle	Algebra	Trigonometry	Total
1	Knowledge	1, 4(2)	9(1)			28(1)		4
2	Understanding	2(1)	11, 14(2)	3(1)				4
3	Application		17(1)	7(1)	29(1)	26(1)	20(1)	5
4	Skill	6, 10(2)	16(1)	19, 25(2)	24(1)		30(1)	7
	Total	5	5	4	2	2	2	20

Note: Figures in parenthesis show number of questions.