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Comparative performance of undergraduate students in micro-teaching using Telegram and WhatsApp in collaborative learning settings

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ARTICLE INFO	ABSTRACT
	The growing concerns to accommodate large classroom sizes, lack of microteaching laboratory and inadequacy of time for every student to present and be properly assessed has affected the performance of students in micro-teaching in Nigeria. This therefore calls for different innovative approaches backed up by technology to ameliorate the problem. Thus, this study checked the comparative performance of undergraduate students in micro-teaching using Telegram and WhatsApp in collaborative learning settings in Gombe State, Nigeria. A sample of 282 students enrolled on Telegram and WhatsApp from Federal University Kashere and Gombe State University, respectively was purposively selected for the study. The two sampled groups were assigned into experimental group I (Telegram) and experimental group II (WhatsApp) in collaborative learning settings using a simple random sampling technique. The instruments for the study comprised of micro-teaching achievement test validated by experts in the field of educational technology and curriculum studies, where a split-half method of reliability was used to obtain a figure of 0.91 using Pearson product moment correlation. Descriptive statistics involving mean and standard deviation was used to answer the research questions while inferential statistics involving an independent sample t-test was used to test the null hypotheses at 0.05 level of significance. Findings revealed that while the students in both Telegram and WhatsApp platforms performed better in the post-test, a significant difference was obtained in the achievement and retention of the two groups in favor of WhatsApp. It was therefore recommended that lecturers should deploy the use of Telegram and WhatsApp in collaborative learning settings to cover for large classroom sizes and lack of micro-teaching laboratory. **Keywords:** collaborative learning, social media, achievement, retention, micro-teaching, technology

INTRODUCTION

Technology has permeated almost all human endeavors, and its importance has cut across all facets of life. Advancement in technology has transformed teaching and learning to be more student-centered through the incorporation of technology in education. In view of this, different educational techniques other than teacher-centered instruction have emerged and are making tremendous breakthroughs in tertiary education (Falode & Mohammed, 2023; Mohammed & Ogar, 2023). Technology assists students in gaining knowledge, skills and techniques as they interact with each other. Educators now send instructional contents in a more flexible way because, through the use of technology, instructors can communicate through voice, images and texts. Technology provides interesting opportunities that enrich and transform teaching and learning, thereby providing teachers and students with new tools to access, organize and present information with the aim of enriching lessons through the use of various multimedia. Hence, most learners are visual learners as technology has become an integral part of their lives and without technology they may not be able to learn effectively (Azman et al., 2018). Technology affords different approach to learning by making learning interesting, engaging and student-centered (Mohammed et al., 2023). Technology is being used for teaching especially through social media learning that is now on the rise.

Social media are characterized as Web 2.0 e-learning resources, which usually emphasize active participation, connectivity, collaboration and sharing of knowledge and ideas among different users (Muniasamy et al., 2015). Hakim (2019) viewed social media as a group of internet-based applications built on the ideological and technological foundations of Web 2.0, which allow for the creation and exchange of contents that are user-generated. Social media are a form of electronic communication channels such as websites for social networking and micro-blogging through which users create online communities in order to share

information, ideas, personal messages, and other contents. Of recent, social media platforms like Telegram enable teaching and learning to be interactive and simplified because of the active engagement involved.

Telegram platform offers a student-centered teaching and learning engagement that uses online learning resources to facilitate information sharing outside the constraints of time and place. Telegram combines self-study with asynchronous interactions to promote learning, and it can be used to facilitate learning in conventional settings, as well as distance and continuing education (Denysiuk et al., 2018). Telegram is one of the most common user friendly social media platforms today, which allows users to create groups of up to 200,000 members and channels for transmission to infinite audiences. Telegram has the capacity of sending files of up to two gigabyte in size. Telegram is so flexible that it can be used not only to send and receive texts, images, audio and video but also documents in different formats. It should be noted that these types of documents are the main formats often used by lecturers to prepare notes, tutorials and assignments and then share with their students (Vivienne, 2016). Comparable to Telegram in the areas of online discussion and interaction is the WhatsApp application that is used by a wide range of users worldwide.

WhatsApp as a free messenger application, which works on various platforms like iPhone and android systems, and it is largely used to send multimedia contents like photos, videos, audio, and other instant messages in the form of text. WhatsApp can therefore be used for teaching and learning through the creation of online groups aimed at fostering communication with students, creating dialogue and encourage students to exchange ideas and information among themselves (Sonia & Rawekar, 2017). WhatsApp is now an effective way of increasing the success of teaching and learning because it makes students to develop a positive attitude towards their various courses. This is due to the fact that students can conveniently decide when to respond depending on their time schedule. WhatsApp incorporates the use of multimedia contents, where pictures, audio, videos, graphics, and texts can be used to support normal conventional classes (Cetinkaya, 2017). Ofoka (2019) added that WhatsApp enhances communication as well as active engagement of students when it comes to teaching and learning. It provides a medium through which teachers can discuss with students, and for everyone to participate including the introvert, which therefore boosts their confidence and engagement unlike during normal classroom session. The active engagement and interaction of students in Telegram and WhatsApp group discussion encourages high collaboration amongst students and their tutors.

Collaborative learning, as observed by Srinivas (2014), is based on the idea that learning is a naturally social act in which the participants talk among themselves. It therefore means that learners need a social environment, where they will interact, communicate, share and construct knowledge with peers for effective learning to take place. Under the collaborative learning environment, students are challenged to participate because they listen to different perspectives and are required to articulate and defend their ideas. Collaborative learning, which is embedded from primary schools to tertiary level institutions is among the most explored learning method in the 21st century according to Mahbib et al. (2017). One of the major advantages of social media collaboration is that feedback can be given immediately. Online collaboration allows the collection of data for the comparison, discussion, analysis and feedback of knowledge among students, being an effective way to obtain experimental data that demonstrates the power of technology in group projects, which generate reports of its practices (Luna & Sequera, 2015). According to Williams and Augustine (2015), collaborative learning is very essential in teaching and learning because it encourages learners' active engagement in the learning process when they are usually involved in searching, finding and evaluating information from a variety of sources such as peers, teachers and the wider society to increase their knowledge; thus becoming accountable and responsible for the successful achievement of their own learning outcome and that of others. Based on the foregoing discuss, collaborative learning can be of great importance towards teaching micro-teaching. At this point, it is critical to ask that can Telegram and WhatsApp be used in a collaborative setting to enhance students' performance in micro-teaching?

Micro-teaching is a scaled-down simulated teaching designed for the training of both pre- and in-service teachers. At the university level, it is taught in order to perfect the skills of the student-teachers and to enable them to prepare for the teaching-practice exercise and to prepare for life as professional teachers. Apart from being an essential process of transforming and modifying the student-teacher behavior to demonstrate a given behavior, micro-teaching also provides a huge opportunity for students to develop and improve their pedagogical skills within a small group of students mostly using limited period of five-10 minutes, records on video tape for reviewing, responding, refining and re-teaching towards perfection (Garba, 2018). Micro-teaching enables student-teachers to focus their attention on some specific skills at a time until mastery is attained. After acquiring competence in a number of skills in this way, the student-teacher takes to micro-teaching so as to demonstrate some level of competence. It is a vital technique, which provides continuous training to serving teachers. The Nigerian national policy on education recognizes the need to incorporate ICT in education. This will surely enhance achievement and retention of students in micro-teaching.

Academic achievement generally signifies the outcome of learning, having exposed the student to a particular treatment. It represents performance outcomes that indicate the extent to which a person has accomplished specific goals that were the focus of activities in instructional environments, specifically in school, college, and university (Ahmed & Inti, 2021). In the same vein, retention is the ability to remember things that have been taught (Mohammed & Ogar, 2023). Students' retentive ability can be enhanced through the use of appropriate technology like teaching student through social media platforms.

Studies on the effect of Telegram and WhatsApp platforms as they enhance achievement and retention have been found to be very promising. For example, studies by Almogheerah (2020), Arash et al. (2018), Cetinkaya and Sutco (2018), Gurluyer (2019), Liya and Dede (2017), Ofoka (2019), Ruba et al. (2018), and Safitri (2021) all revealed that WhatsApp increased students achievement compared to other methods or platforms. A study by Ilobeneke et al. (2018a) revealed no significant difference in the achievement of students exposed to WhatsApp and Facebook instruction. Also, studies by Achor et al. (2014), Bupo (2019), Ilobeneke et al. (2018b), and Ofoka (2019) all revealed a significant difference in the retention scores of students. On the other hand, studies by Azman et al. (2018), Berenji and Saeidi (2017), Movafagh (2017), Nabati (2018), Suryati and Adnyana (2020), Tabrizi and Onvani

Table 1. Research design layout

Groups	Pre-test	Treatment	Post-test	Retention
Experimental group I	O_1	X_1	O_2	O_3
Experimental group II	O_1	X_2	O_2	O_3

Note. O_1: Pre-test for experimental group I & experimental group II; O_2: Post-test for experimental group I & experimental group II; O_3: Retention for experimental group I & experimental group II; X_1: Telegram learning platform; & X_2: WhatsApp learning platform

(2020), Vahdat et al. (2020), Xobande (2017), and Zarei (2017) revealed that students' performance increased tremendously when exposed to instruction on Telegram. Studies by Fahimeh and Zahrah (2019) and Xobande (2017) reported no significant difference in the retention of students exposed to Telegram instruction. In the light of this, more studies are therefore needed in collaborative learning settings to further reveal the potential of Telegram and WhatsApp instruction.

As a result of the foregoing and in spite of the technological advancement that has made teaching and learning to be effective, flexible, collaborative, engaging and interesting, most Nigerian lecturers do not leverage on the collaborative features provided by Telegram and WhatsApp platforms to cover for factors like lack of micro-teaching laboratories, large classroom sizes and inadequacy of time for students to present and be properly accessed. Normally, students teach before a small group and their teaching is recorded so as to be accessed and corrected. But because of the aforementioned challenges, students cannot be effectively accessed. The implication of these challenges, if not checked, is that teachers who are not well grounded will continue to be produced thereby adding to the education problems in Nigeria. Several studies on the effects of Telegram and WhatsApp on achievement and retention were conducted but none was carried out on Micro-teaching in collaborative learning settings in Nigeria. Thus, there is need to incorporate Telegram and WhatsApp platforms in collaborative learning settings to cover for lack of micro-teaching laboratories, large classroom sizes and inadequacy of time, where teachers and students can collaborate in groups in order to improve learning. As a result, one of the best ways towards ensuring effectiveness of teaching micro-teaching amongst undergraduate students is through the use of social media learning, which entails the grouping of students into various social media platforms like WhatsApp and Telegram. This study therefore hinges on the fact that whether Telegram and WhatsApp-enhanced instructions in collaborative learning settings can accommodate large classroom sizes, lack of micro-teaching laboratory and inadequate time for everyone to present in order to enhance teaching and learning of micro-teaching among undergraduates in Gombe State, Nigeria.

Purpose of the Study

The purpose of the study is to investigate the comparative effect of Telegram and WhatsApp-enhanced instruction in collaborative learning settings on learning outcomes in micro-teaching among undergraduates in Gombe State. Specifically, the study seeks to:

1. Determine the effect of Telegram and WhatsApp-enhanced instruction in collaborative learning settings on the achievement of undergraduate students in micro-teaching.
2. Examine the effect of Telegram and WhatsApp-enhanced instruction in collaborative learning settings on the retention of undergraduate students in micro-teaching.

Research Questions

The following research questions were raised and answered in this study:

1. What is the difference in the mean achievement scores of undergraduate students taught micro-teaching using Telegram and WhatsApp-enhanced instruction in collaborative learning settings?
2. What is the difference in the mean retention scores of undergraduate students taught micro-teaching using Telegram and WhatsApp-enhanced instruction in collaborative learning settings?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

HO1. There is no significant difference in the mean achievement scores of undergraduate students taught micro-teaching using Telegram and WhatsApp-enhanced instruction in collaborative learning settings.

HO2. There is no significant difference in the mean retention scores of undergraduate students taught micro-teaching using Telegram and WhatsApp-enhanced instruction in collaborative learning settings.

METHODOLOGY

The design adopted in this study is the pre-/post-test, quasi-experimental control group design (**Table 1**).

Participants

A sample of 282 year three faculty of education students that were enrolled on Telegram and WhatsApp platforms from Federal University Kashere and Gombe State University, Nigeria, respectively was purposively selected to be used for the study. The choice of year three students was because they were the ones offering micro-teaching as a course in preparation for teaching practice exercise. The schools were purposively sampled because they were the only two universities in Gombe State offering micro-

Table 2. Mean & standard deviation of pre- & post-test scores of experimental group I & II

Group	n	Pre-test		Post-test		Mean gain
		Mean	Standard deviation	Mean	Standard deviation	
Telegram	117	34.87	5.46	66.57	11.94	31.70
WhatsApp	165	36.55	4.33	76.35	7.31	39.80

Table 3. Mean & standard deviation of post-test & retention scores of experimental group I & II

Group	n	Post-test		Retention		Mean difference
		Mean	Standard deviation	Mean	Standard deviation	
Telegram	117	66.57	11.94	64.29	10.86	2.28
WhatsApp	165	76.35	7.31	73.27	6.39	3.08

teaching as a course. Faculty of education was selected because micro-teaching is taught as a course in the faculty. The two sampled groups were assigned into experimental group I and experimental group II using a simple random sampling technique.

Instrument

The research instrument consisted of a micro-teaching achievement test (MTAT) (**Appendix A**), which comprised of 30-item multiple choice questions developed based on Bloom's taxonomy table of specifications that cuts across the cognitive domain of educational objectives. The reason for the table of specification was to show the spread of the questions across all the objectives. The achievement test had two sections: A and B. Section A solicited information about the students' personal data, while section B comprised of 30 objective questions drawn from the departmental handbook with options A-D, containing one correct answer and three distracters. The multiple-choice questions were administered as a pre-test, post-test, and retention test to experimental group I and experimental group II. MTAT was validated by experts in the field of educational technology and curriculum studies, whereby split-half method of reliability was used to obtain a value of 0.91 using Pearson product moment correlation.

Data Collection & Analysis

The students were added into Telegram and WhatsApp platforms for engagement during the first week of the experiment. A pre-test was administered in order to determine the entry level of the students in the second week. The online interaction took place in the third, fourth, and fifth weeks, whereby various micro-teaching contents in the form of online texts and instant messages were dropped by the researcher at least twice a week. In order to create an online collaborative learning environment, the students were grouped into various sub-groups based on their teaching subjects, where they worked together in groups. The researcher also dropped assignments that required the students to work in groups and to discuss online in order to provide solutions. By the sixth week, a post-test was administered. Another test was administered after two weeks in order to determine the level of retention. The data collected were analyzed using descriptive statistics involving mean and standard deviation while inferential statistics involving an independent sample t-test was used to test the null hypothesis using SPSS package version 25.

RESULTS

Research Question 1. What is the difference in the mean achievement scores of undergraduate students taught micro-teaching using Telegram and WhatsApp-enhanced instruction in collaborative learning settings?

The data presented in **Table 2** shows the mean and standard deviation of the pre- and post-test achievement scores of both experimental group I (Telegram) and experimental group II (WhatsApp). From **Table 2**, experimental group I (Telegram) had a mean and standard deviation of 34.87 and 5.46, respectively in the pre-test; and a mean score of 66.57 and a standard deviation of 11.94 in the post-test. The pre- and post-test mean difference was 31.70. Also, from **Table 2**, it can be seen that experimental group II (WhatsApp) had a mean of 36.55 and a standard deviation of 4.33 in the pre-test and a mean score of 76.35 and a standard deviation of 7.31 in the post-test. The pre- and post-test mean difference was 39.80. With this result, therefore, the students in experimental group II (WhatsApp) performed better with a higher mean, than those in experimental group I (Telegram).

Research Question 2. What is the difference in the mean retention scores of undergraduate students taught micro-teaching using Telegram and WhatsApp-enhanced instruction in collaborative learning settings?

Table 3 shows the post-test and retention scores of experimental group I (Telegram) and experimental group II (WhatsApp). From **Table 3**, experimental group I (Telegram) had a mean score of 66.57 and a standard deviation of 11.94 in the post-test and a mean of 64.29 and a standard deviation of 10.86 in the retention test. The mean difference between the post-test and retention scores in experimental group I was 2.28. Also, from **Table 3**, experimental group II (WhatsApp) had a mean of 76.35 and a standard deviation of 7.31 in the post-test and a mean of 73.27 and a standard deviation of 6.39 in the retention test. The mean difference in the post-test and retention scores of experimental group II (WhatsApp) was 3.08. With this result, experimental group II (WhatsApp), with a higher mean retention gain of 3.08, retained more than the experimental group I (Telegram).

Testing of Null Hypothesis

Hypothesis 1. There is no significant difference in the mean achievement scores of undergraduate students taught micro-teaching using Telegram and WhatsApp-enhanced instruction in collaborative learning settings.

Table 4. Independent sample t-test result of mean achievement scores of students taught micro-teaching using Telegram & WhatsApp learning platform

Group	n	Mean	Standard deviation	df	t-value	p-value	Decision
Telegram	117	66.57	11.94				
				280	3.264	.000	Rejected
WhatsApp	165	76.35	7.31				

Note. Significant at 0.05 (p<0.05)

Table 5. Independent sample t-test result of mean retention scores of students taught micro-teaching using Telegram & WhatsApp learning platform

Group	n	Mean	Standard deviation	df	t-value	p-value	Decision
Telegram	117	64.29	10.86				
				280	4.292	.000	Rejected
WhatsApp	165	73.27	6.39				

Note. Significant at 0.05 (p<0.05)

In order to test hypothesis one, independent sample t-test was used to analyze the scores of the two groups as presented in **Table 4**. **Table 4** shows the independent sample t-test result of the mean achievement scores of students taught micro-teaching using Telegram (**Appendix B**) and WhatsApp learning platform (**Appendix C**). From **Table 4**, it can be observed that Telegram had a mean of 66.57 and standard deviation of 11.94. WhatsApp had a mean of 76.35 and a standard deviation of 7.31. Also, t= 3.264, df= 280 and p-value= .000. Therefore, since p<0.05, the null hypothesis is hereby rejected. This means that there is a significant difference in the mean achievement scores of the two groups in favour of the WhatsApp platform.

Hypothesis 2. There is no significant difference in the mean retention scores of undergraduate students taught micro-teaching using Telegram and WhatsApp-enhanced instruction in collaborative learning settings.

In order to test hypothesis two, independent sample t-test was used to analyze the scores of the two groups as presented in **Table 5**. **Table 5** shows the independent sample t-test result of the mean retention scores of students taught micro-teaching using Telegram and WhatsApp learning platform. From **Table 5**, it can be observed that Telegram had a mean retention of 64.29 and standard deviation of 10.86. WhatsApp had a mean retention of 73.27 and a standard deviation of 6.39. Also, t= 4.292, df= 280 and p-value= 0.000. Therefore, since p<0.05, the null hypothesis is hereby rejected. This means that there is a significant difference in the mean retention scores of the two groups in favor of the WhatsApp platform.

DISCUSSION

The result of hypothesis one revealed that the students exposed to WhatsApp learning platform in collaborative learning settings performed better than those in Telegram learning platform. This was seen when hypothesis one was tested and it was rejected, which therefore means a significant difference existed in the mean scores of the two groups in favor of WhatsApp learning platform. The significant difference in favor of WhatsApp was due to the level of active participation, timely response and prompt interaction, which the students on the WhatsApp platform displayed and which manifested in their achievement, unlike the Telegram platform, which had slow response and interaction. It is also due to the fact that WhatsApp is a popular application as against Telegram. This finding agrees with the findings of Almogheerah (2020), Arash et al. (2018), Cetinkaya and Sutco (2018), Gurleyere (2019), Liya and Dede (2017), Ofoka (2019), Ruba et al. (2018), and Safitri (2021), which revealed that WhatsApp increased students achievement when compared to other strategies. Though the aforementioned studies did not incorporate collaborative learning, it revealed that WhatsApp can be used to enhance achievement more than Telegram. On the other hand, this finding disagrees with the studies conducted by Azman et al. (2018), Berenji and Saeidi (2017), Movafagh (2017), Nabati (2018), Suryati and Adnyana (2020), Tabrizi and Onvani (2020), Vahdat et al. (2020), Xobande (2017), and Zarei (2017), which revealed that students' performance increased tremendously when exposed to instruction on Telegram. Also, this finding disagrees with Ilobeneke et al. (2018a), which revealed no significant difference in the achievement of students exposed to WhatsApp and Facebook instruction. This means that Telegram is also an effective channel of increasing students' achievement. As a result of the variation found in this study, more studies can therefore be conducted.

The result of hypothesis two revealed that the students exposed to WhatsApp learning platform in collaborative learning settings retained better than those on Telegram platform. The was seen when hypothesis two was tested and it was rejected, which therefore means a significant difference existed in the mean retention scores of the two groups in favor of WhatsApp learning platform. The high retention exhibited by students on the WhatsApp platform was due to the level of active participation and interaction, which the students displayed, thereby forming a lasting cognitive experience on them unlike the Telegram platform, where interaction and response was less. Additionally, the students in the WhatsApp platform had a slightly higher retention test scores, indicating that majority of them retained the concepts better than their Telegram counterpart. This finding agrees with Achor et al. (2014) and Ofoka (2019) whose finding revealed a significant difference in the retention scores of students. However, it disagrees with the findings of Fahimeh and Zahrah (2019) and Xobande (2017), which reported no significant difference in the retention of students exposed to Telegram instruction. While some of the findings revealed WhatsApp can enhance retention more than Telegram, some of the findings revealed no significant difference in the retention of students. Therefore, more studies need to be conducted to close the gaps.

CONCLUSIONS

The deployment of WhatsApp and Telegram platforms in collaborative learning settings increased students' achievement and retention but students in WhatsApp platform performed better in achievement and retention compared to Telegram. Though this study is limited to just one Nigerian state and university undergraduates, these platforms have, however, demonstrated their potential to tackle the problems of lack of micro-teaching laboratories, inadequate time by making learning flexible as well as large classroom sizes for they can be used effectively to improve learning outcomes of students in micro-teaching. In line with this, more studies can be conducted in other areas to further authenticate the effectiveness of these platforms.

Recommendations

Based on the findings of this study, the following recommendations are hereby made:

1. Lecturers should adopt the use of social media tools like Telegram and WhatsApp during classroom instruction because they are engaging, interesting, and flexible.
2. Lecturers should adopt the use of social media collaborative learning approach since students are always on their phones, they can equally use it for instructional purposes.
3. Micro-teaching lecturers should deploy the use of social media tools like Telegram and WhatsApp to cover for large classroom sizes, lack of micro-teaching laboratory and other tight schedules.

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APPENDIX A: MICRO-TEACHING ACHIEVEMENT TEST

Section A

School:

Level:

Gender:

Instruction: Attempt all questions by ticking the correct option from letter A-D.

Time: 30 minutes

Section B

1. Which of the following best defines micro-teaching?
   (A) A form of teaching where a student teacher teaches a large audience
   (B) An instructional technique where student-teachers are trained to teach in a simulated manner where teaching is recorded for feedback and correction
   (C) A process of breaking teaching into smaller units for easy comprehension
   (D) All of the above

2. In every effective micro-teaching process, there are ….. stages involved.
   (A) 2
   (B) 3
   (C) 1
   (D) 4

3. One of the reasons why micro-teaching is recorded include …..?
   (A) For students to receive corrections from peers and supervisors in order to ensure perfection
   (B) For student-teachers to be cheered during instruction
   (C) For teaching-learning to be made easy
   (D) For supervisors to score student-teachers appropriately

4. The following are advantages of micro-teaching to student-teachers except.
   (A) It enables them with the required skills needed before joining a wider audience
   (B) It provides a practical approach to teaching
   (C) It gives feedback where necessary
   (D) It is too time consuming

5. The following important components make up micro-teaching except.
   (A) Student-teacher
   (B) Feedback mechanism
   (C) Problem identification
   (D) Teaching skills

6. ….. is a series of deliberate activities geared towards obtaining a desirable change in behavior of learner as a result of experience
   (A) Teaching
   (B) Learning
   (C) Demonstration
   (D) Practicum

7. One special characteristics of micro-teaching that makes it unique is.
   (A) It is real and focuses on the training needed towards accomplishing a task
   (B) It brings students together in unity
   (C) No feedback is necessarily needed
   (D) None of the above

8. Why is it necessary for pre-service teachers to teach and re-teach during micro-teaching exercise?
   (A) It enables them to plan well
   (B) It enables them to be properly access and scrutinize so that correction can be made for mastery
   (C) To increase their mastery of communication
   (D) It enables lessons to be broadcast to audience

9. Which one of these is the goal of micro-teaching according to the National Policy on Education (NPE)?

    (A) It boosts' confidence

    (B) It enhances teaching and learning

    (C) To produce highly qualified motivated, competent and professional teachers at all levels of education

    (D) To encourage high school enrolment rate in teacher-education program

10. Teaching and learning can be said to have achieved its aim when …..?

    (A) Students are involved in tasks

    (B) Skills are imparted to students during instruction

    (C) Information is thoroughly circulated

    (D) There is a desirable change in the behavior of learners due to new experience

11. The major principles of teaching include the following except.

    (A) Simple to complex

    (B) Inquiry to perfection

    (C) Concrete to abstract

    (D) Immediate to distant

12. It is very necessary to plan lesson to be learner-friendly so as to …..?

    (A) Arouse the interest and ability of learners

    (B) Maintain proper classroom control

    (C) Communicate effectively and efficiently

    (D) Eliminate large classroom size

13. Every effective teaching-learning process passes through the following stages except.

    (A) Input stage

    (B) Perception stage

    (C) Activity stage

    (D) Reward stage

14. The term behavioral objectives can best be described as …..?

    (A) Learning characteristics during teaching

    (B) Classroom management outcomes

    (C) Statement of expected outcomes after teaching-learning has taken place

    (D) None of the above

15. Instructional objectives are usually stated in …..?

    (A) General and specific terms

    (B) Specific and divergent terms

    (C) General and multi-dimensional terms

    (D) Single to multiple

16. The learning objective that describes a broad learning outcome is known as …..?

    (A) Specific objective

    (B) General objective

    (C) Dimensional objective

    (D) Divergent objective

17. Specific objectives are usually stated using action verbs in order to …..?

    (A) Have a clear purpose of learning

    (B) Ensure broad outcome is achieved

    (C) Simplify learning and break them into smaller units

    (D) Determine observable and measurable outcomes

18. For any behavioral objectives to have any meaningful value, it must be …..?

    (A) Stated in clear and unambiguous terms

    (B) Specific

    (C) Relevant to subject matter

    (D) All of the above

19. Instructional objectives are considered to be very vital ingredients during teaching and learning because …..?
    (A) They make learning quite easy for students
    (B) They save time and energy
    (C) They give a lesson a clear purpose and direction
    (D) None of the above

20. Lesson plan is defined as …..?
    (A) A skeletal framework that guides and directs the teacher during teaching and learning
    (B) A clear plan that guides the learners to learn very well during teaching and learning
    (C) An evaluation technique that enhances teaching and learning
    (D) A systematic analysis of teaching and learning process

21. Which of the following constitutes one of the major components of a lesson plan?
    (A) Teaching, communication, comprehension, and behavioral objectives
    (B) Behavioral objectives, writing, evaluation and conclusion
    (C) Introduction, lesson objectives, teaching aides and lesson presentation
    (D) Development, supervision, recording and practical

22. When designing a lesson plan, it is always important to align evaluation to tally with instructional objectives so as to …..?
    (A) Determine whether stated objectives have been achieved or not
    (B) Determine whether learning is student or teacher centered
    (C) Evaluate teaching strategies used during instruction
    (D) None of the above

23. In every teaching-learning process, the importance of entry behavior needs not to be overemphasized because …..?
    (A) It enables teachers to measure past knowledge in order to build learning around what students already know
    (B) It measures students perception skills to be used during instruction
    (C) It improves the cognitive skills of learners
    (D) All of the above

24. During every teaching and learning, instructional resources are considered to be very vital if used properly, which of the following is true about them?
    (A) They make learning to be very interesting
    (B) They simplify learning to be student-centered
    (C) They make learning faster to grasp because they stimulate many senses
    (D) All of the above

25. When an instructional resource appeals to both the sense of sight and hearing, it can be grouped under the following heading …..
    (A) Perceptual material, visual material and cognitive concepts
    (B) Audio, video, and multimedia resources
    (C) Computer, word processor, diorama and 3D materials
    (D) Programmed instruction, virtual concepts, and blended learning

26. Depending on their usage in the classroom, instructional resources can be broadly classified into …..?
    (A) Computer assisted packages and animation
    (B) Massive open online courses and open educational resources
    (C) Projected and non-projected materials
    (D) None of the above

27. Classroom communication is very important during teaching due to the following reason …..
    (A) It allows students to follow lesson at ease
    (B) It enables teachers to plan well during lesson delivery
    (C) It enables teachers to know whether their lesson has been grasped or not
    (D) None of the above

28. Which of the following categories describes the sequential stages of communication process in the classroom?
    (A) Communicator, message, medium, receiver and feedback
    (B) Feedback, message, receiver, medium and communicator
    (C) Receiver, communicator, medium feedback and message
    (D) Medium, communicator, receiver, feedback and message

29. During teaching and learning, there are barriers considered to be against effective communication, which amongst this can constitute barrier to communication?

    (A) Noise

    (B) Language incompetence

    (C) Lack of clarity

    (D) All of the above

30. In order to improve classroom communication, a competent teacher needs to …..?

    (A) Ensure silence and make sure students follow attentively

    (B) Teach contents repeatedly for easy understanding

    (C) Walk round the classroom during teaching

    (D) Give frequent assignments and class activities to student

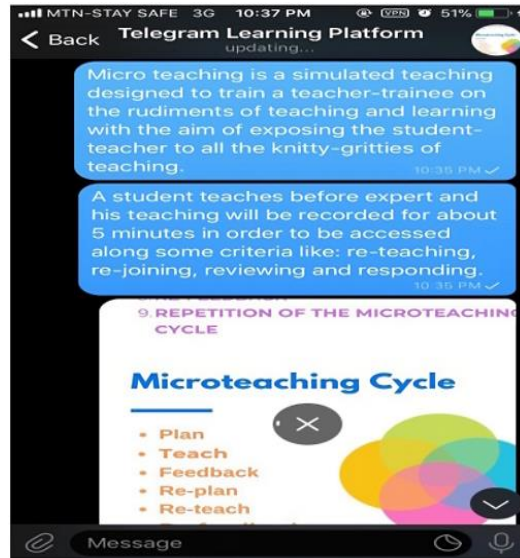## APPENDIX B: TELEGRAM LEARNING PLATFORM

Figure B1. Telegram learning platform (Interphase of the group chat used for the study through Telegram application)

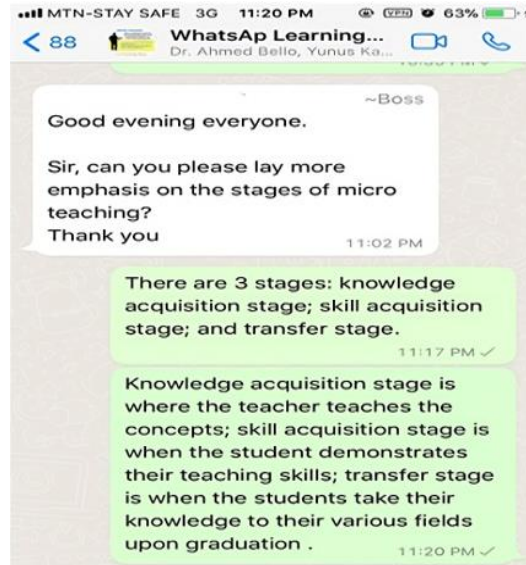## APPENDIX C: WHATSAPP LEARNING PLATFORM

Figure C1. WhatsApp learning platform (Interphase of the group chat used for the study through WhatsApp application)