

**AWARENESS, FAMILIARITY AND PREPAREDNESS OF USE OF GOOGLE  
CLASSROOM IN TEACHING CHEMISTRY AMONG UNDERGRADUATE  
STUDENTS OF FEDERAL UNIVERSITY OF TECHNOLOGY MINNA**

**BY**

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## **ABSTRACT**

The study was undertaken to investigate the level of awareness, familiarity and preparedness of use of Google Classroom in teaching chemistry among undergraduate students in Federal University of Technology Minna. Three research questions were raised to guide the study. The research employed Survey research method. The population of the study comprised of 473 students from Science Education Department; 90 students were randomly selected and used as sample for the study. The Instrument that was used as sample for the Study was a set of 30 structured questions on a questionnaire which was validated by an expert. The copies of the questionnaire were administered personally by the researcher, the questionnaire items were collected and analyzed using mean and standard deviation. The findings revealed that there is a moderate awareness, familiarity and preparedness from the students towards the use of Google Classroom in teaching chemistry. The researcher finally recommended that Universities should encourage lecturers to start using Google Classroom as a medium of teaching their students; universities should organise seminar and workshops for lecturers to train them on the use of Google Classroom.

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## **CHAPTER ONE**

### **1.0. INTRODUCTION**

#### **1.1 Background to the Study**

The integration of technology is not a necessarily new trend in the field of education. For decades, schools around the world have attempted to implement technology plans which aim to supply more frequent use of technology to their students. The assumption is that, technology cannot only improve day-to-day classroom instructions but also, its interactive nature and necessity for life after school have lasting effects on students (Iftakhar, 2016; Keppler et al, 2014). Many schools began with simple computer labs stationed within the school building for periodic use scheduled by the teachers (Bebell & Kay, 2010; Sell et al., 2012). Then, as the personal computing trend continued to grow and as an effort to stay abreast of the 21st century skills, schools began purchasing more computers and other technology devices with the goal of having a much more available devices for student usage (Bebell & Kay, 2010; Bebell & O'Dwyer, 2010; Keppler et al., 2014).

In recent years, there have been drastic changes in the classroom that affect the delivery of instruction and how students are being taught, their classroom experience and how they learn. For instance, most American educators have made the switch from writing with chalk on a chalkboard to writing with dry-erase marker on a dry-erase board or by writing using a touch screen on a Smart Board.

Furthermore, in the 2010s, many school districts introduced a one-to-one technology initiative such that all students have access to a device such as a chrome book, laptop, iPad, etc. Some

educators have gone fully digital and paperless, moving toward a greener classroom as well as preparing students for the technological advances of the future. Conversely, some educators have technology-free classrooms and all student assignments are carried out on paper. Most educators at this point use a balance between technology use and paper use when it comes to the medium in which they educate their students. Recently, Learning Management Systems (LMS) such as BlackBoard, Canvas, Google Classroom and Moodle have become increasingly popular at the middle school, high school, and higher education levels.

Digital Tools stresses on learners continuing learning activities through technology devices such as desktop computers, notebook, tablet, and smart phones (Keane, 2012). These devices allow learning to take place without teachers and students meeting face to face. Google Classroom is a free application designed to assist students and teachers connect, work together, organize and create assignments. It enables learning to be paperless. As a Digital Tool, Google Classroom is accessible only to users with Google Apps for Education (GAFE). This is a free collaborative set of tools. These tools includes web tools like Google Docs, Google Drive, Gmail etc. All users with GAFE account, have access to these web tools. Google Classroom can be used at any level of education (basic, post basic and tertiary), but this depends on the teachers' and students' competence (Bell, 2015). Teachers work together with their students without meeting face to face. Teachers can post materials for their students through this medium, they can also make announcements and create assignments and quizzes for students to complete, submit and save online either in a web browser or on Google Classroom App.

Google Classroom can be a tool that makes learners become active participants (Nagele, 2017). It also has some benefits such as paperless, which can be accessed anywhere and everywhere as long as there is internet connection and from any devices to communicate between teachers and

students, to give feedback to students and personalized learning. It has a learning feature that makes teachers create and handle assignments actively and also provide feedback to students. Google Classroom makes it easier for teachers to handle students work. It is really beneficial for both teachers and students, because it is easy and simple to use.

Lots of activities can be done with Google Classroom when the class is ongoing. The activities include;

1. Making announcement: teacher can give announcements about the update of the class in this section. They can attach files and class materials as well.
2. Create assignment: this is the most substantial feature in Google Classroom. Teacher can upload assignments for student within due time to submit. Student also can download materials that have been uploaded by teacher to finish discussed with teacher or other students if allowed by teacher.
3. Re-use of previous post: important posts can be re-use by the teacher in this section, such as, announcement, assignment, and questions.
4. Ask questions: in this section, students can create or ask questions to be discussed with the teacher or other students if allowed by the teacher.

## **1.2 Statement of the Problem**

The general consensus among educators across the world is that these LMS act as a classroom facilitator but are unable to replace the role of the teacher (Abid Azhar, Iqbal, 2018). The human aspect of teaching is not something that a machine is able to replace or rival at this point in time,



however the machine is something that can be used to enhance and supplement the role of the teacher. The implementation of a LMS will not intrinsically lead to better student performance, but this is not denying the fact that implementing these systems are highly beneficial. In the Special Education setting, a problem that many teachers report is that, students often lack awareness, familiarity and preparedness, evidenced by losing assignments, forgetting to write names on the assignments, missing deadlines, missing work due to absenteeism, and forgetting to turn in work that has actually been completed.

### **1.3 Aim and Objectives of the Study**

The aim of this study is to determine the level of awareness, familiarity and preparedness of use of Google Classroom in teaching Chemistry among science education students of Federal University of Technology Minna, Niger State.

The study specifically sought to:

- A. To determine the level of awareness of use of Google Classroom in teaching chemistry among science education students of Federal University of Technology Minna.
- B. To determine the extent to which science education students of Federal University of Technology Minna are familiar to the use of Google Classroom.
- C. To determine how prepared science education students of Federal University of Technology Minna are to the use of Google Classroom.

### **1.4 Research Questions**

The research question that framed this study;

1. What is the level of awareness of use of Google Classroom in teaching chemistry among undergraduate students in Federal University of Technology Minna?
2. What is the extent to which science education students of Federal University of Technology Minna are familiar to the use of Google Classroom in teaching chemistry?
3. How prepared are science education students of Federal University of Technology Minna in teaching chemistry using Google Classroom?

### **1.5 Significance of the Study**

The findings of the study will be of immense benefit to all educational stakeholders, particularly lecturers, researchers, students, curriculum planners, government and the public.

The findings of this study will be of benefit to the lecturers as it will enlighten them on the preparedness of students on the use of Google Classroom.

It will be useful to the government and its agencies as the government would want easy access to social network by students and these could lead to government subsidizing the cost and also making sure internet connection must be required before schools can be established.

It will also be useful to curriculum planners as it will enable them to carry out thorough assessment on the implementation, effectiveness and impact of Google Classroom social network in teaching and learning.

The students will benefit because they are prepared to use Google Classroom as a medium of teaching.

The study will also be useful to researchers as a source of literature or related literature that adds to the available materials for present and future research study.

## **1.6 Scope of the Study**

This research will cover science education in FUTMinna, Niger state, Nigeria. It will only focus on awareness, familiarity and preparedness of use of Google Classroom in teaching chemistry among science education students in FUTminna. Respondents of this study will be students. Students who are going to be covered come from science education within Futminna, with different financial backgrounds. They therefore have different capabilities in acquiring technological devices such as laptops, i-pads and even smartphones.

Students from well off families have better access to internet and more sophisticated gadgets and thus able to do more online than those from disadvantaged families. This study will be limited to students in federal university of technology Minna, Nigeria.

## **1.7 Operational Definations**

For the purpose of this study, the following terms will be defined as follows:

1. LMS: Learning Management System: software application for the administration, documentation, tracking, reporting and delivery of educational courses or training programs.
2. Google Classroom: free web service developed by Google for schools that aim to simplify creating, distributing and grading assignments in a paperless way. The primary purpose is to streamline the process of sharing files between teachers and students.
3. Technology Integration: the international use of various types of technology in a setting such as schools and Classrooms (Bakia et al., 2009).

4. Google Chromebook: a laptop computer which relies on internet access, allowing users to share and run cloud-based applications (google.com, 2016)
5. GAFE: (Goole apps for education) Google for Education is a service from Google that provides independently customizable versions of several Google products using a domain name provided by the customer.
6. Smartphone: a mobile phone that performs many functions of a computer, typically having a touchscreen interface, internet access, and an operating system capable of running downloaded apps.
7. Canvas: a strong, coarse unbleached cloth made from hemp, flax, or a similar yarn, used to make items such as sails and tents and as a surface for oil painting.
8. Digital tools: are programs, websites or online resources that can make tasks easier to complete. A lot of these can be accessed in web browsers without needing to be downloaded, and you can access them both at home and in work.

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

This research is reviewing previous researches that has been done, that which examine the awareness, familiarity and preparedness of use of Google Classroom. Numerous research pieces were examined. Throughout existing years, various studies were taken to investigate whether or not there is awareness, familiarity and preparedness of use of Google Classroom.

Thus, this chapter therefore focuses on reviewing related literatures to this study, which throws more light on the problems under investigation. It is categorized into these sections:

Conceptual Framework

Empirical Framework

Theoretical Framework

#### **2.1 Conceptual Framework**

In the conceptual framework, the researcher desires that it is necessary to explain some relevant terms in the topic under investigation which are as follows:

##### **2.1.1 E-learning in Educational Perspective**

##### **2.1.2 The Definition of E-learning**

E-learning is being introduced in the beginning of third millennium. ELearning make user can access course material everywhere via internet. Using e-learning can encourage and improve learner's interaction in the class. Based on Agarwal & Pandey (2012), e-learning focuses on the use of technology in learning and education. E-learning refers to the use of information and

communication technology in learning process which consists of electronic media. According to Guri-Rosenblit (2005) “E-learning is the use of electronic media for a variety of learning purposes that range from add-on functions in conventional classrooms to full substitution for the face-to-face meetings by online encounters”. Stockley (1996-2017) stated, e-learning implicates the use of electronic device (e.g. computer or mobile phone) in some ways to provide educational training or learning purpose. Sangrà et.al (2012) said, e-learning can be defined as natural evolution of distance learning which utilizes newest tool in technological context for arrangement in education.

From those definitions, we can conclude that e-learning is learning which utilizes electronic technologies to access educational curriculum outside traditional classroom and it refers to learning that delivered online. E-learning makes learning process easier, such as, sharing material or file, submit tasks, and do quizzes. E-learning also has been applied in many institutions (e.g. school and university). Through e-learning, both teacher and students can easily communicate. Also, teacher can give feedback on the assignment via online class platform.

### 2.1.3 E-learning Delivery Method

In our context nowadays, e-learning is basically divided into two types, synchronous and asynchronous. These two types have their own pros and cons. Appropriate technique for students depends on how they absorb information. Based on Arisandhy (2010), synchronous is online conversation and video conference, while asynchronous is learning that can be done even both teacher and student are offline. Shahabadia & Uplane (2015) said that synchronous is e-learning that usually scheduled in a real-time and the learning experiences are also live.

Whereas asynchronous is e-learning that utilizes Computer Mediation Communication (CMC) to achieve “anytime and everywhere” learning through online discussion. It is similar to

synchronous e-learning which focuses on learner using online learning source to facilitate many kinds of information without thinking about time and place. The main benefit of synchronous e-learning is to enable students in avoiding feeling insulated in communicating with others during learning process, but not flexible about time. Students should put aside their time to attend the online session live and real-time. This type of e-learning is not suitable for busy people. While asynchronous e-learning makes students able to follow the curriculum with their own desire without worrying about schedule. This type of e-learning is appropriate for students who like to arrange schedule of learning by themselves and can choose where and when they can continue their learning. It makes students feel insulated because there is no live and interactive educational environment.

## **2.2 Google Classroom**

### **2.2.1 The Definition of Google Classroom**

Google Classroom is a tool which facilitates students and teacher collaboration; also teacher can create and distribute assignments for students in an online classroom for free (Beal, 2017). It makes teachers simply build groups to share assignments and announcements. Google Classroom can be a tool that makes learners become active participants. Nagele (2017) said, teachers can create active lessons which are student-centered, collaborative, and unforgettable just through Google Classroom, because it provides easy-to-use learning features with students of all categories able to cooperate. Google Classroom is helpful to all of learner categories and including adult learners. It also has some benefits such as paperless, can be accessed anywhere and everywhere as long as there is internet connection and from any devices, to communicate

between teachers and students, to give feedback to students, and personalized learning. It has a learning feature that makes teachers create and handle assignments actively and also provide feedback to students. Google Classroom makes it easier for teachers to handle students work. It is really beneficial for both teachers and students, because it is easy and simple to use.

### **2.2.2 How it Works**

Google Classroom may still be unfamiliar for some people. Therefore, here is a guide line on how to use Google Classroom properly for better understanding based on (Google, 2018). First, login using [classroom.google.com](https://classroom.google.com) and log in using Google Apps for Education account with institution e-mail address. To create the very first class, click on the “+” button next to the e-mail address. “Create class” will appear and then press on it. After that, add a class name. Teacher can add the details about the class, such as, description and instructions for students in the “about” tab, and also Google Drive folder for classroom materials and can attach outline course and lesson plan. Finally, the class is ready and students can freely join if they have institutional Google accounts and they should find class code in the “stream” tab.

### **2.2.3 Features of Google Classroom**

Lots of activities we can do with Google Classroom when the class is operated. First, one can create announcement. Teacher can give announcements about the update of the class in this section. They can attach files and class materials as well. Secondly, create assignment. This is the most substantial feature in Google Classroom. Teacher can upload assignments for student within due time to submit. Student also can download materials that have been uploaded by teacher to finish their task. Third, create question. In this section, student can create question to be discussed with teacher or other students if allowed by teacher. Fourth, re-use post. Important post can be use by teacher in this section, such as, announcement, assignment, and question.



#### **2.2.4 The Benefits and Limitations**

Google Classroom has copious facilities which are beneficial for its users. A few of them are user friendly, cost free, cell phone friendly, and time saving. Using Google Classroom is really easy. Based on Janzen (2014), "Google Classroom's design purposefully simplifies the instructional interface and options used for delivering and tracking assignments; communication with the entire course or individuals is also simplified through announcements, email, and push notifications". Using Google Classroom does not need any cost. It is free for anyone. Although users have institutional Google Account, they still can use it for free. Anyone can use Google classroom on any mobile device as long as there is internet connection, because it designs to be fast respond. Janzen (2014) also states that "mobile access to learning materials that are attractive and easy to interact with is critical in today's web connected learning environments". By using Google Classroom both teacher and student can save their time. According to Iftakhar (2016), it integrates other Google apps, like, Docs, Slides, Drive and Spreadsheets. Nevertheless, the whole process of administering assignments, grading, formative assessment, and feedback is simplified and streamlined.

In spite of various benefits, Google Classroom also has some limitations. Some of them as mentioned by Pappas (2015) are limited integration option, too googlish, no automated updates, difficult learner sharing and editing problems. It is difficult for teacher to manage teaching materials and to set deadline for assignments because Google Classroom is not synchronized with Google Calendar or any other calendar. Some of Google Classrooms' buttons are only familiar for Google users. It can make new user feeling confused or needing more time to deal with it. That is why Pappas define Google Classroom as too "googlish". There is no auto-update feature in Google Classroom; it makes learners miss an important announcement because they

should refresh it regularly. Also, students cannot share their documents to others without permission from teacher. Learners can only edit assignment after they create and distribute to Google Classroom. They can keep and delete any part of the assignments. In spite of some drawbacks, we can conclude that Google Classroom is a good thing for students and teachers because it is easy to use, efficient, effective, better for the environment, and enable collaboration between teacher and student becomes easier. With Google Classroom, learning process can be effective and efficient because students and teachers can access Google Classroom anytime and anywhere in electronic devices with internet network.

## **2.3 Learning Media**

### **2.3.1 The Definition of Learning Media**

Media refers to material that presented with words and pictures so that students can better understand the material if it is presented with words and also pictures rather than with words. According to Sariffudin (2013), in general, learning media means teaching and learning tool which can be used to stimulate skills of learners, thoughts and feeling, therefore to facilitate the learning process. Based on Mateer et.al (2018), media can be important in active learning such as group discussions or case studies. Example of media can include a film, song or newspaper article, even students can make their own media. Media is an important component in the learning system, the communication process will not run optimally in learning without the media.

Anderson (1976) as cited on Foresty (2017) classify media into 10 categories as follows:

No	Media Categories	Example in Learning
1	Audio	Audio tapes, radio, CD, telephone
2	Print	Textbooks, modules, brochures, leaflets, pictures
3	Audio-Print	Audio tapes that include written materials
4	Proyeksi Visual Silent	Overhead transparency (OHT), Film frames (slides)
5	Audio isual Projection Silent	Film frames (slides) voiced
6	Visual Motion	Silent film
7	Audio Visual Motion	silent motion film, video / VCD, TV
8	Physical Objects	Real objects, models, specimens
9	Humans and the Environment	Teacher, librarian, laboratory
10	Computer	CAI (Computer Assisted Instructional = computer-assisted learning), CMI (Computer Managed Instructional)

### 2.3.2 The Use of Learning Media in Language Learning

Media has an important role in learning. Media can make both students and teacher engaged in class. Based on Williams (2018), role of media in classroom are; appeal to multiple learning styles, create an authentic learning experience, strengthens critical-thinking skills, teaches students to use media. While, Tileston (2003) stated that media can give effect on students' modalities, motivation behavior management, reaching higher levels of thought, and real world applications. Thus, media is important in learning process. Media make easier to access information, make an interesting learning process and also make students exciting. The advantages of using media based on Pedagogy in Action (2018), such as; media can gain students' attention and maintain students' interest, students can sharpen their analytical skills, enable students to see concepts and new examples, experience world beyond their own.

In addition to numerous advantages, there are also a number of cautions that should keep in mind in utilizing media. The challenges of using media according to Perez (2015) are; how to implement media effectively, understanding how it works, and how to integrate media in learning.

Finally, using media in classroom make students aware with the changing of electronic communications nowadays. Through media, students not only learn to access about the material, gain information, but students can value and become wise when using the media.

## **2.4 Empirical Studies**

There are some previous researches which are relevant to this study. First, research from Shaharane et.al (2016) did a research about the effectiveness of Google Classroom's active learning activities for data mining subject under the decision sciences program. Technology Acceptance Model (TAM) has been employed to measure the effectiveness of the learning activities. The target populations for this research were students who enrolled in data mining subject where the class was taught in a computer lab. In order to have random selection method, simple random sampling had been applied when choosing the sample. The survey included questions on demographics, five predictor variables, and student satisfaction. Demographic questions covered gender, marital status, course, and the average on internet accessed. In order to develop the questionnaire, the Internet self-efficacy scale was developed by Eastin & LaRose and used as reference. A total of 100 valid unduplicated responses from students who enrolled in data mining subject were used in this study. The results indicated that the majority of students felt satisfy with Google Classroom's tools that were introduced in the class. Results of data analysis showed that all ratios are above averages. In particular, comparative performance is good in the areas of ease of access, perceived usefulness, communication and interaction,

instruction delivery and students' satisfaction towards Google Classroom's active learning activities.

The second study is from Iftakhar (2016), the study is about what and how Google Classroom works. The purpose of this study is to report the overall view of Google Classroom from different class. This research presents brief features of Google Classroom. In addition, some adoption factors (such as organizational, social, personal and technological) have been reassessed for the research purpose. The research questions are :

- a) What factors influence teacher to use Google Classroom?
- b) How does teacher use Google Classroom in their teaching?
- c) What are the barriers to use Google Classroom?
- d) What are students' responses to the Google Classroom?

The analysis of the results of the questionnaire indicate that this study can be effective in understanding and evaluating teachers' and learners' perceptives to ensure quality teaching and learning through Google classroom. This study also presents some new evidence on the potential of Google classrooms in teaching. This study used interview and observations to collect the data. The participants were teachers and students of Daffodil International University. The interviews were conducted with seven teachers: four males and three females. Three teachers are from BBA Department, one teacher is from LLB, two teachers are from English Department and one from CSE. 35 students also selected from English Department. The total respondents were 42. The result of the study shows that from teachers' perspective, they agree that Google Classroom is very useful. From students' perspective, some said that Google Classroom is also helpful, while

others stated that they scared and instructed when using Google Classroom. The third study is from Wijaya (2016). The study is about analysis of factors affecting on the use of Google Classroom to support lecturers. The study was developed by adopting the model of TAM to see from both the perception in the TAM that affect the use of Google Classroom by some students STT Musi. Population of this research is the students who are already using Google Classroom in the lecture. Data obtained as much as 90 questionnaires distributed by using purposive sampling technique to all students active in the odd academic year 2014-2015. Results from this study showed that the perceived Easy of Use and perceptions of perceived usefulness positively affect the use of Google Classroom. And both these perceptions also jointly affect the use of Google Classroom.

The last one is from student of English Language Education Department, Rossytawati (2013). Her research is about the challenges in using Google Classroom. The purpose of the research is to identify the challenges of using Google Classroom as a learning tool for students of English Language Department Islamic University of Indonesia. The method of the research is quantitative research. The research involved 126 students of English Language Department in Islamic University of Indonesia, consist of 3 batches there are 2014, 2015 and 2016. The result of the research can be interpreted as the students feel that most challenging aspect in using Google Classroom is not very helpful for them to minimize their time and effort in doing and collecting the assignment. The differences between these researches and my research are on the variable, subjects of the study, participants, and methodology used. In this study, the researcher adopts the Shaharane et.al (2016) questionnaire because the questionnaire is reliable with value above 0.90. This research aims to identify students' responses on using Google Classroom. The

participants were students of English Language Education Department batch 2014-2017 because students in English Language Education Department already used Google Classroom.

This research used quantitative method. Those researches are relevant with this study because those researches also examining about Google Classroom; thus, they can be used as references.

## 2.4 Theoretical Framework

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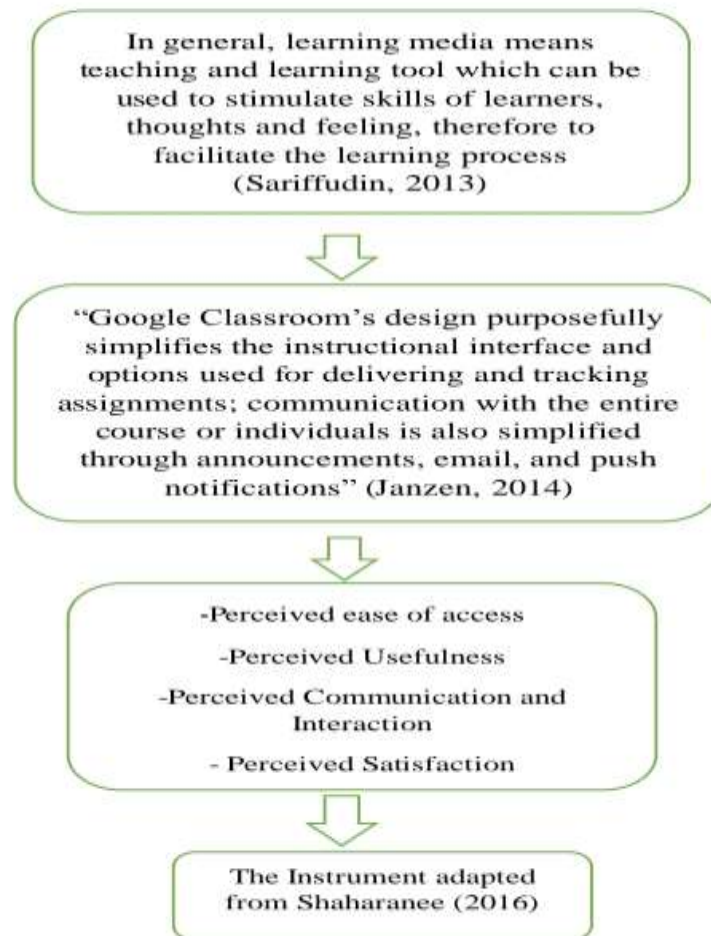


Figure 1. Theoretical Framework



## 2.6 Operational Definitions

In discussing this title, the researcher finds several terms that need further explanation as clearly as possible to avoid misunderstanding in this research study;

**Learning Media:** Learning media are teaching and learning tool which can be used to stimulate skills of learners, thoughts and feeling, therefore to facilitate the learning process

**Classroom:** Google Classroom is a tool which make both students and teacher collaboration; also teacher can create and distribute assignments for students in an online classroom for free

(Nagele, 2017). **CMC:** Computer-mediated communication (CMC) is a process in which human data interaction occurs through computer (Simpson, 2002)

PBI (English Language Education Department) PBI is one of the major in Faculty of Psychology and Socio-Cultural Sciences,

Islamic University of Indonesia. **ICT:** ICT (Information and communications technology), some components that sustain modern computing Rouse (2007-2018)

**TAM:** TAM (Technology Acceptance Model), a user accept information systems technology based on the theory of reasoned action (Surendran, 2012).

## **CHAPTER THREE**

### **3.0 RESEARCH METHODOLOGY**

This chapter presents the method which is used for collecting data in this research. This chapter will discuss research design, population of the study, sample and sampling procedure/technique, instrumentation, validity, reliability, method of data collection, method of data analysis.

#### **3.1 Research Design**

The research design employed in this study is a survey research. It sought the opinion of students through questionnaire administered to them in order to establish the awareness, familiarity and preparedness of use of Google Classroom in teaching Chemistry. The reason behind choosing this design is because this study focuses on measuring the opinion of students towards their level of awareness, familiarity and preparedness of use of Google Classroom in teaching Chemistry. Human opinion varies a lot and is highly unpredictable; it cannot be mathematically calculated.

#### **3.2 Population of the Study**

The research population for this study was drawn from the Department of sciences Education Bosso campus FUT Minna. The target population of this study was students of FUT Minna. There are three Options in the department which include chemistry education, mathematics education, Biology education in FUT Minna. According to Arikunto (2006), population is the overall subject of research. The approximate population of students in the Department is 473 students.

#### **3.3 Sample and Sampling Techniques**

Sample is a part of population which has same characteristics (Arikunto, 2006). The sample of this research consisted of 473 students of Science Education Department from chemistry,

biology and mathematics options respectively. The technique for selecting sample in this research was using probability sampling. It is a sampling technique which provides equal opportunity for each element (member) of the population to be selected as a sample member. According to Creswell (2009), in probability sampling, representative sample from a population provides the ability to generalize to a population. Probability sampling has four methods namely simple random sampling, proportionate stratified random sampling, disproportionate random sampling and cluster sampling. This research used proportionate stratified random sampling. This method is used when the population has a member/element that is not homogeneous and stratified proportionally. Proportionate stratified random sampling is done by making layers (strata). Then, each layer is taken as a number of subjects randomly. The number of subjects from each layer (strata) is the research sample. This research used 5% of error rate to set the target sample of the students. Slovins' formula was used to calculate the number of sample from the population. The Slovins' formula shown as followed.

### **3.4 Research Instrument**

A researcher needs to develop instruments with which to collect the necessary information. This study used questionnaires as instruments of study. A questionnaire consists of a number of questions printed or typed in a definite order on a form or set of forms. The questionnaires were administered to respondents who then duly filled them on their own to provide the required data for the study. The structured questionnaire involve the use of a set of predetermined questions of highly standardized techniques of recording.

### **3.5 Validity of the Research Instrument**

To ensure validation, copies of the questionnaire alongside the research questions were given to professionals in Educational Technology and Science Education to evaluate and make

endorsements. The experts concerned went through the research questions and the questionnaire carefully to ascertain the appropriateness and sufficiency of the Instrument, and make recommendations. After the recommendations and corrections from the experts were effected, the Instrument was then use for the purpose of data collection.

### **3.6 Reliability of the Instrument**

For the reliability of the Instrument to be established, a pilot study was carried out using 90 randomly selected students from the research sample. The data collected based on the responses of the 90 students was analyzed to establish the reliability of the Instrument. The respondents and their data are not included in the actual study process as they were only for testing purpose.

The reliability of the Instrument was measured using Cronbach's alpha, the most popular coefficient of reliability measure. Based on the result obtained on analysis using SPSS; the value of cronbach's alpha was 0.78 which was higher than the 0.70 minimum value recommended by Nunnally (1978). This means that the instrument is reliable and can be used for data collection.

### **3.7 Method of data Collection**

The researcher visited the departments under study and administered questionnaires to students picked through purposive sampling. The questionnaires were then collected by the researcher for data analysis. The questionnaire findings were then carefully analyzed; findings were shown in figures (statistically) and then discussed. Conclusions were made based on the findings.

### **3.8 Analysis of Data**

The questionnaires were collected immediately the respondents completed their answers. Data from the questionnaires were analyzed using mean and Standard Deviation to answer the research question while independent t-test was used to test the formulated hypothesis at 0.05

significant level. Then, the result were analyzed descriptively. The results were also shown in tables. Conclusions were drawn based on the findings.

## CHAPTER FOUR

### 4.0. RESULT AND DISCUSSION

#### 4.1 Research Question One

What is the level of awareness of the use of Google Classroom in teaching chemistry among undergraduate students in Federal University Technology?

**Table 1:** Mean respondents of Science Education students of FUT Minna on students' level of Awareness towards the use of Google Classroom in teaching chemistry.

N=90; Highly Aware (HA), Aware (A), Not Aware (NA), highly not Aware (HNA).

S/N	Items	N	Mean	S.D	Remarks
1	Are you aware of the existence of Google Classroom?	90	2.68	0.79	<b>Moderately Aware</b>
2	Are you aware that Google Classroom is easy to use?	90	2.48	0.63	<b>Moderately Aware</b>
3	Are you aware that Google Classroom is an excellent medium for social interaction (lecturer vs students and student vs student)?	90	2.44	0.59	<b>Not Aware</b>
4	Are you aware that Google Classroom is user friendly?	90	2.79	0.93	<b>Moderately Aware</b>
5	Are you aware that Google Classroom helps in	90	2.44	0.94	<b>Not Aware</b>

	submitting assignment on time?					
6	Are you aware that Google Classroom is cost free?	90	2.54	0.89	<b>Moderately Aware</b>	
7	Are you aware that Google Classroom is cell phone friendly?	90	2.43	0.74	<b>Not Aware</b>	
8	Are you aware that Google Classroom is time saving?	90	2.34	0.69	<b>Not Aware</b>	
9	Are you aware that Google Classroom can be used as a grading system in monitoring the performance and understanding the students?	90	2.68	0.84	<b>Moderately Aware</b>	
10	Are you that Google Classroom can be made as learning initiative and motivational booster?	90	2.89	0.68	<b>Moderately Aware</b>	
<b>Grand mean</b>			<b>2.57</b>			

The table above shows the level of awareness on the use of Google Classroom in teaching Chemistry among science Education students in FUTMinna. The Grand Mean from the Questionnaire of the research Question is (XGM=2.57). This can be concluded that the respondents are moderately aware with the use of Google Classroom in teaching Chemistry.

## 4.2 Research Question Two

What is the extent to which science education students of Federal University of Technology Minna are familiar to the use of Google Classroom in teaching chemistry?

**Table 2:** Mean respondents of Science Education students of FUT Minna on students' level of Familiarity towards the use of Google Classroom in teaching chemistry.

**N=90;** Highly Familiar (HF), Moderately Familiar (MF), Not Familiar (NF), Highly not Familiar (HNF).

S/N	Items	N	Mean	S.D	Remarks
1	Are you familiar with the creation of Google account?	90	2.93	0.54	<b>Moderately Familiar</b>
2	Are you familiar with signing in on the Google Classroom?	90	2.59	0.70	<b>Moderately Familiar</b>
3	Are you familiar with creation of class on Google Classroom?	90	2.44	0.52	<b>Moderately Familiar</b>
4	Are you familiar with creating assignment on Google Classroom	90	2.43	0.54	<b>Not Familiar</b>
5	Are you familiar with receiving assignment on Google Classroom?	90	2.57	0.84	<b>Not Familiar</b>
6	Are you familiar with submitting assignments	90	2.44	0.00	<b>Not Familiar</b>



	on Google Classroom?				
7	Are you familiar with Navigating the system on Google Classroom?	90	2.54	0.53	<b>Moderately Familiar</b>
8	Are you familiar with accessing Google drive folder for classroom materials on Google Classroom?	90	2.42	0.62	<b>Not Familiar</b>
9	Are you familiar with attaching outline courses and lesson plan on Google Classroom?	90	2.42	0.62	<b>Not Familiar</b>
10	Are you familiar with joining a class using a class code	90	2.99	0.74	<b>Moderately Familiar</b>
<b>Grand Mean</b>			<b>2.58</b>		

The Table above shows the level of familiarity on the use of Google Classroom in teaching Chemistry among science Education students in FUTMinna. The Grand Mean from the Questionnaire of the research Question is (XGM=2.58). This can be concluded that the respondents are moderately familiar with the use of Google Classroom in teaching Chemistry.

### 4.3 Research Question Three

How prepared are science education students of Federal University of Technology Minna in teaching chemistry using Google Classroom?

**Table 2:** Mean respondents of Science Education students of FUT Minna on students' level of Preparedness towards the use of Google Class room in teaching Chemistry

N=90; Highly Prepared (HP), Moderately Prepared (MP), Not Prepared(NP),Highly not Prepared (HNP).

S/N	Items	N	Mean	S.D	Remarks
1	How prepared are you to use Google Classroom?	90	2.59	0.79	<b>Moderately Prepared</b>
2	How prepared are you to use Google Classroom for creating classes?	90	2.48	0.62	<b>Moderately Prepared</b>
3	How prepare are you to use Google Classroom for Learning?	90	2.47	0.65	<b>Moderately Prepared</b>
4	How prepared are you to use Google Classroom for creating assignment?	90	2.76	0.93	<b>Moderately Prepared</b>
5	How prepared are you on recommending this method of learning to be applied to other appropriate subjects?	90	2.48	0.98	<b>Moderately Prepared</b>
6	How prepared are you to use Google Classroom as learning initiative and motivation booster?	90	2.53	0.89	<b>Moderately Prepared</b>
7	How prepared are you to use Google Classroom for interaction with other students?	90	2.45	0.84	<b>Moderately Prepared</b>
8	How prepared are you to use Google Classroom as a grading system in monitoring the	90	2.47	0.79	<b>Moderately Prepared</b>

	performance and understanding the current topic discussed?				
9	How prepared are you to make Google Classroom a user friendly?	90	2.69	0.83	<b>Moderately Prepared</b>
10	How prepared are you to make Google Classroom a cellphone friendly?	90	2.88	0.67	<b>Moderately Prepared</b>
<b>Grand Mean</b>			<b>2.58</b>		

The table above shows the level of preparedness on the use of Google Classroom in teaching Chemistry among science Education students in FUTMinna. The Grand Mean from the Questionnaire of the research Question is (XGM=2.58). This can be concluded that the respondents are moderately prepared to use Google Classroom in teaching Chemistry.

#### **4.4 Discussion of Findings**

The following are the findings of the study presented based on the research questions highlighted for the study.

#### **Findings related to the level of awareness towards the use of Google Classroom in teaching chemistry**

The finding revealed that the respondents (Science Education Students of FUTMinna) agreed with the items to have moderate awareness towards the use of Google Classroom in teaching chemistry. The findings in this study is similar with the findings obtained in a study conducted by Wijaya (2016) in Indonesia. Wijaya found that her respondents too agreed to be aware with

Google Classroom providing numerous benefits as an important e-learning platform. The respondents also claimed that Google Classroom increased the effectiveness in completing the tasks assigned by the faculty.

### **Finding that related to the students level of familiarity in teaching chemistry using Google Classroom among science Education Students**

The finding revealed that the respondents (Science Education Students of FUTMinna) agreed with the items to have *moderate familiarity* towards the use of Google Classroom in teaching chemistry. The findings in this study is also similar with the findings obtained in a study conducted by Wijaya (2016) in Indonesia. Wijaya found that her respondents too agreed to be familiar with Google Classroom providing numerous benefits as an important e-learning platform. The respondents also claimed that Google Classroom increased the effectiveness in completing the tasks assigned by the faculty.

### **Finding that related to the level of preparedness of use of Google Classroom in teaching chemistry among science education students**

The finding revealed that the respondents (Science Education Students of FUTMinna) agreed with all the items indicating their moderate preparedness in teaching chemistry using Google Classroom among science Education students. This result is similar with Shahraneet al (2016) that many students feel satisfied with Google Classroom because of its effectiveness and efficiency.

### **Summary of Findings**

The following are the findings of the study presented based on the research questions highlighted for the study.

1. The findings revealed that the respondents (Science Education students of FUTMinna) have a moderate awareness towards the use of Google Classroom in teaching Chemistry.
2. The findings revealed that the respondents (Science Education students of FUTMinna) have a moderate familiarity towards the use of Google Classroom in teaching Chemistry.
3. The findings revealed that the respondents (Science Education students of FUTMinna) have a moderate preparedness towards the use of Google Classroom in teaching Chemistry.

## **CHAPTER FIVE**

### **5.0 SUMMARY, CONCLUSION AND RECOMMENDATION**

#### **5.1 Introduction**

This chapter describes the summary of the research based on research finding in previous chapter, conclusion and recommendation for further research

## **5.2 Summary of the Study**

This study was undertaken to determine the level of awareness, familiarity and preparedness of use of Google Classroom in teaching Chemistry among science education students of Federal University of Technology Minna, Niger State.

A Survey research was adopted in carrying out this research with the aid of a questionnaire to find out students opinion in the awareness, familiarity and preparedness of use of Google Classroom in teaching chemistry. Data were collected, analyzed and decision were made based on the analysis. Results from this work reveal that there is a moderate awareness, familiarity and preparedness from the respondents in the use of Google Classroom in teaching chemistry. This implies that there is no significant difference in terms of awareness, familiarity and preparedness; which shows that most of the respondents are prepared to use Google Classroom in teaching chemistry.

## **5.3 Conclusion**

The purpose of this research is to identify the level of awareness, familiarity and preparedness on the use of Google Classroom in teaching Chemistry among FUTMinna students. There were 90 students who completed the questionnaires.

The conclusion in this research is based on the research findings and discussion on students' responses on the use of Google Classroom. This research findings shows that in general, Students from Science Education of FUTMinna feel moderately aware (XGM =2.57), moderately familiar (XGM=2.58) and the students feel moderately prepared (XGM=2.58) with the use of Google Classroom in teaching Chemistry.

### **5.3 Recommendation**

In general, based on the result of this research, it was however recommend that:

1. Universities should encourage their lecturers to start using Google Classroom as a medium of teaching their students.
2. Universities should organize a seminar and workshops for their lecturers to train them on the use of Google Classroom as a medium of teaching
3. Universities should however advice their students on Google Classroom maximization; students are expected to use Google Classroom properly and creatively; because the way students use a tool is what makes the difference. The way students properly use Google Classroom can make learning better; more engaging, and more student-centred.

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## APPENDIX

### QUESTIONNAIRE

DEPARTMENT OF SCIENCE EDUCATION

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, NIGER STATE.

QUESTIONNAIRE ON: Awareness, Familiarity and Preparedness of use of Google Classroom in Teaching Chemistry among Science Education Students in FUT minna

Dear Respondent,

You have been randomly chosen as a respondent in the above titled survey which is being undertaken as part of an educational research in partial fulfillment of the Bachelor of Technology Degree in science Education of FUT Minna. Your cooperation in filling this questionnaire will ensure success of the study. Please feel free to indicate your choice by putting a tick(√) in the checkbox before the answer you feel most appropriate. The responses will be for academic purposes only and will be treated with utmost confidentiality.

#### SECTION A: PERSONAL DATA

Gender: male (  ).      Female (  )

#### SECTION B:

Please kindly tick the appropriate column on your personal assessment whereas, highly Aware (HA), Aware (A), Not aware (NA), Highly not aware (HNA).

Awareness of using Google classroom in teaching chemistry

S/N		HA	A	NA	HNA
1	Are you aware of the existence of Google Classroom?				
2	Are you aware that Google Classroom is easy to use?				
3	Are aware that Google Classroom is an excellent medium for social interaction (lecturer vs students and student vs student)?				
4	Are you aware that Google Classroom is user friendly?				
5	Are you aware that Google Classroom helps in submitting assignment on time?				
6	Are you aware that Google Classroom is cost free?				
7	Are you aware that Google Classroom is cell phone friendly?				
8	Are you aware that Google Classroom is time saving?				
9	Are you aware that Google Classroom can be used as a grading system in monitoring the performance and				

	understanding the students?				
10	Are you aware that Google Classroom can be made as learning initiative and motivational booster?				

Please kindly tick the appropriate column on your personal assessment whereas, highly familiar(HF), Familiar(F), Not familiar(NF), Highly not familiar(HNF).

#### Familiarity of Google Classroom in teaching chemistry

S/N		HF	F	NF	HNF
1	Are you familiar with the creation of Google account?				
2	Are you familiar with signing in on the Google Classroom?				
3	Are you familiar with the creation of class on Google Classroom?				
4	Are you familiar with creating assignment on Google Classroom?				
5	Are you familiar with receiving assignment on Google Classroom?				
6	Are you familiar with submitting assignment on				

	Google Classroom?				
7	Are you familiar with Navigating the system on Google Classroom?				
8	Are you familiar with accessing Google drive folder for Classroom materials on Google Classroom?				
9	Are you familiar with attaching outline courses and lesson plan on Google Classroom?				
10	Are you familiar with joining a class using a class code?				

Please kindly tick the appropriate column on your personal Assessment whereas, Highly prepared (HP), Prepared (P), Not prepared (NP), Highly not prepared (HNP).

Preparedness in using of Google Classroom in teaching chemistry

S/N		HP	P	NP	HNP
1	How prepared are you to use Google Classroom?				
2	How prepared are you to use Google Classroom for creating classes?				
3	How prepared are you to use Google Classroom				

	for learning?				
4	How prepared are you to use Google Classroom for creating assignment?				
5	How prepared are you on recommending this method of learning to be applied to other appropriate subjects?				
6	How prepared are you to use Google Classroom as learning initiative and motivational booster?				
7	How prepared are you to use Google Classroom for interaction with other students?				
8	How prepared are you to use Google Classroom as grading system in monitoring the performance and understanding the current topic discussed?				
9	How prepared are you to make Google Classroom a user friendly?				
10	How prepared are you to make Google Classroom a cell phone friendly?				

THANK YOU



