PREPAREDNESS, AWARENESS AND UTILIZATION OF YOUTUBE IN TEACHING CHEMISTRY AMONG SCIENCE EDUCATION STUDENTS IN FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

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ABSTRACT

This study focused on preparedness, awareness and utilization of YouTube in teaching chemistry among science Education students in FUTMinna. The study had three objectives; three research questions were raise to guide the study. The study adopted descriptive survey design, the research population is 473 which is the population of Science Education Department, FUTMinna and 90 were used as research sample which was determine by simple random sampling technique. The researcher developed a self designed four liker scale questionnaire, the instrument was validated by two experts in the department and reliability of instrument was determined using cronbach's Alpha which was found to be 0.72. The data obtained from respondent was analyzed using mean and standard deviation. Findings of this research revealed that respondent are moderately prepared to use YouTube in teaching chemistry. It also revealed that the respondents were moderately aware of teaching chemistry using YouTube. It also revealed that the respondents often utilized YouTube in teaching and learning chemistry. It was recommended that School administrators should provide wireless network within the school to help students to easily access YouTube during their learning time, University lecturers and teachers should create and upload more educational contents on YouTube to ease learning.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

YouTube, founded in 2005, is a video-sharing which is considered to be a relatively new phenomenon, and teachers together with researchers have started to pay close attention to its possibilities within the educational setting. (Mullen & Wedwick, 2008). In addition, it was suggested by Mullen & Wedwick (2008) that videos have the potential to enhance almost any classroom lesson and this are available on YouTube and other video sharing web sites such as TeacherTube, SchoolTube, United Streaming, OneWorldTV, Yahoo! Video, Google Video, and MSN Soapbox. YouTube provides free access to a substantial amount of educational videos (Buzzetto-More, 2014) therefore making it a viable option for students to receive useful material for learning purposes. YouTube provides a professional platform through YouTube EDU for learning outside from the informal communication channels.

According to Buzzetto More (2014). YouTube EDU is a service for educators which contains short lessons from teachers, entire university courses, professional development materials, and motivational videos from international leaders. Research on YouTube in the classroom does not necessary shed light on utterly new phenomena but has been explored in literature (Berk, 2015) who assessed multimedia teaching using YouTube videos. Despite the availability of YouTube research, it is essential to note that there is still a shortage of empirical evidence of

causal relationships between perceived usefulness of YouTube, perceived ease of use of YouTube, student attitudes towards the use of YouTube and Behavioral intention to Use YouTube. Consequently, further scholarly introspections are considered necessary. Much of what is written on the subject is based on samples from developed countries such as Saudi Arabia, Hong Kong, Malaysia and United Kingdom. For example Almobarraz (2018) determined the utilization of YouTube as an information resource to support university courses in Saudi Arabia. In addition, Szeto and Cheng (2014) determined the usage of ICT tools and YouTube for teaching during their teaching practicums in Hong Kong. Albahlal (2019) investigated the impact of YouTube on improving secondary school students' speaking skills in Riyadh. Furthermore, June, Yaacob and Kheng (2014) investigated the use of YouTube videos and interactive activities in stimulating critical thinking among students from a public university in Malaysia. Duncan, Yarwood-Ross and Haigh (2013) examined YouTube as a source of clinical skills education in United Kingdom. In addition, previous academics have performed their research in different environments within the South African context, by concentrating on YouTube as an academic tool for ICT lecturers (Roodt, de Villiers, Johnston, Ophoff & Peier, 2014). Using YouTube in the classroom for the net generation of students (Roodt & Peier, 2013). In addition, Jordaan and Jordaan (2017) conducted a study which focused on using YouTube as a reflection tool for a service-learning module at the University of Pretoria in South Africa. Moreover, Olasina (2017) conducted an evaluation of educational values of YouTube videos for academic writing among students in Scottsville, Province of KwaZulu-Natal, South Africa. YouTube as an educational tool has been recently receiving a great deal of attention from researcher and teachers. To this end a modified conceptual model based on the technology acceptance model (TAM) was proposed to look at preparedness, awareness and utilization of YouTube in teaching chemistry among science Education.

Inferring from the aforementioned studies, there is scant evidence of studies focusing on the background that influence on behavioral intension of students to use YouTube as an educational tool for learning. YouTube provides countless opportunities and effective means for learners to make learning and practice more meaningful and independent. Based on what Balcikanli (2011) pointed out in his research, YouTube presents an infinite resource for language learning because it provides learners with various language sources such as songs, music videos, movie trailers, talk shows, lectures, debates, and parodies. Furthermore, YouTube may be valuable to help meet the learners' needs in using language for real world and their interests in discovering the world. Berk (2010), in his research regarding the use of videos and the brain, explained that the use of videos in educational setting affected the students' both hemispheres of the brain and emotional senses. He referred the use of videos educationally as 'picture superiority effect' which explains that when concepts or ideas are presented in form of pictures, they are more likely to be remembered than in form of words. Then, Berk (2010) added that using YouTube videos in an educational manner is beneficial for 'illustrating a concept, presenting an alternative viewpoint, stimulating a learning activity, and motivating the students'. Balcikanli (2011) also stated that the use of YouTube in independent chemistry learning helps to motivate students to spend more time to learn and practice the target topics

1.2 Statement of the Problem

Teachers have the responsibility to teach the class according to the syllabus given. However, the syllabus does not always cover all of the aspects in chemistry. Teachers only focus on certain aspects of the topic they are covering during classroom instruction. There are some aspects that are left out during classroom instruction which could be very helpful for the

students in improving their understanding, therefore the need for a system to compliment classroom learning, with YouTube being a viable option. YouTube makes available a wide variety of resources to make learning and practice more meaningful and effective for learners. But there has been inadequate literature focusing on the factors that influence behavioral intention of students to utilize YouTube as a learning tool. Therefore, this study aims to investigate the level preparedness, awareness and utilization of YouTube in teaching Chemistry among Science Education students in Federal University of Technology Minna, Niger State

1.2 Aim and Objectives of the Study

Aim and objectives of this study is to examine the preparedness, awareness and utilization of YouTube in teaching chemistry among science Education students in federal university of technology Minna.

1. To find out the level of preparedness among science education students towards the use of YouTube in teaching chemistry.
2. To find out the level of awareness in teaching chemistry using youTube among science education students.
3. To find out the level of utilization of YouTube in teaching chemistry among science education students

1.3 Research Questions

The following research questions were posed to guide the study.

1. What is the level of preparedness of science education towards the use of YouTube in teaching chemistry?

2. What is the level of awareness in teaching chemistry using youTube among science education students?

3. What is the level of utilization of YouTube in teaching chemistry among science education students?

1.4 Significance of the Study

The study examines the preparedness, awareness and utilization of YouTube in teaching chemistry among science students academic background in Federal University Of Technology, Minna achievement in chemistry. Findings from this study would be very useful to the teachers, students and other stake holders in Education sector on if teachers' academic background contributes positively to students' achievement and interest in chemistry, thereby charging them to work towards teachers' academic background. The findings from the study will also bring to an end the long search by educational researchers, a remedy to the problem of lack of awareness on the use of YouTube. It will also be significant to the Education agencies to always monitor the quality of teachers they post to schools.

1.5 Scope of the Study

This research will cover science education in FUTMinna, niger state, Nigeria. It will only focus on preparedness, awareness and utilization of YouTube in teaching chemistry among science education students in FUTminna. Respondents of this study will be students who are going to be covered come from science education within Futminna, with different 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.

1.6 Limitation of Study

Time constraint - The researcher simultaneously engaged in this study with other academic work. This consequently had cut down on the time devoted for the research work.

1.7 Operational Definition of Terms

The following terms are used throughout this qualitative study concerning preparedness, awareness and utilization of YouTube in teaching chemistry among science Education students in federal university of technology, Minna.

Preparedness: The state of being ready.

Awareness: The state of being aware.

Utilization: The state of being used.

Teaching: The work of a teacher.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The view of literature for this study is organized under the following sub heading; Conceptual Framework, Theoretical Framework, Empirical Studies and Summary of Literature Review.

2.1 Conceptual Frame Work:

This chapter reviewed some of the numerous works done by scholars and researchers which are directly related to this research work. Increased internet use and YouTube has become very popular in the recent years. Everyone nowadays is a subscriber to at least one YouTube channels where they have a personal profile online which they use to interact. Teenagers and young adults have especially embraced these sites as a way to connect with their peers, share information, reinvent their personalities, and showcase their social lives (Boyd, 2010).

As opposed to older generations who used resources like the television or newspaper, teenagers now use the Internet for the majority of their daily activities and information gathering (Lewis, 2011). As for teenagers who are still in school, hours spent on the internet can be/is precious study time wasted and this can impact negatively on their academic performance. Schools are also under a lot of pressure from the public, media and policymakers to embrace technology in their teaching and learning.

Use of technology such as internet is one of the most important factors that can influence educational performance of students positively or adversely. Shah et al. (2011) proposed that student users are affected by the internet and this impact is determined by the type of internet

usage. They are positively affected by the informative use of internet while having drastic impact of recreational use of internet on them. Technology has really advanced and with so many digital devices most of which are easily portable, it is very easy to access YouTube.

DeBell and Chapman (2012) pointed out that adolescents and young adults are the heaviest users of YouTube. The main use of YouTube by teenager is watching video communicating and connecting with their peers. YouTube is that means that employs mobile and web based technology [media]to create highly interactive platforms via which individuals and community share, co-create, discuss and modifies user-generated content (Kietzmannn, 2012). YouTube is a phrase being tossed around a lot. It is a website that does not just give you information but interact with you while giving you information. It is a group of internet based application that allows the creation and exchange of users generated content. It is easy to confuse YouTube with social news because we often refer to members of the news as the Internet. Adding to it, that social news site is also YouTube site. Some YouTube website includes:

Social Bookmarking: interact by tagging website and searching through website Book marked by others (Blink list, simple).

Social News: interact by voting for articles and commenting on them (Digg, propello).

Social Photo and Video Sharing: interact by sharing photos or videos and Commenting on the user submission. (YouTube and Fliki).

Wikis: interact by adding articles and editing existing articles. (Wikipedia, wikia). YouTube refers to the means of interaction among people in which they create, share, exchange and comment among themselves in different networks. Andreas and Michael (2010) are of the opinion that YouTube is a group of internet based application that builds on the ideological

foundation and allows the creation and exchange of users – generated content. There has been an increase in the mobile social media which has created new opportunity for browsing.

The internet usage effect of YouTube in views of Nielsen (2012) is that, students continue to spend more time on the YouTube media than any site. The total time spent on YouTube media across mobile devices increased by 37%, 121 billion minutes in July 2012 compared to 88 billion minutes in July 2011. Technology includes the blogs, picture sharing, music sharing, crowd sourcing, e-mail, instant messaging and voice over. These services could be integrated via YouTube network Aggregation platforms.

2.1.1 YouTube

YouTube, created in February 2005, is a website to share videos where its users are able to upload, view, and share video clips. A year later, Google Inc. bought YouTube and it is now operating as a subsidiary of Google. YouTube "uses Adobe Flash Video technology to display a wide variety of user-generated video content"(Balcikanli 2011). As Terantino (2011) stated in his research on Emerging Technologies, YouTube is used for variety of purposes. Most people use YouTube for entertainment purpose, while for other users, YouTube is a site where they get to learn something new through how-to-do videos. There are users who use YouTube to advertise a company or product. Majority of these purposes are not educationally relevant. However, for ELS learners, YouTube provides them with access to authentic material of the target language across the globe. Therefore, the educational value of YouTube will be explored in this research, focusing on independent English language learning. Based on Ghasemi, Hashemi, and Bardine (2011), there are two types of videos in YouTube, pertaining to language learning. The first type is videos created by language teachers who explain a

certain grammar point or some lesson on the language, while the second type of video includes those videos created by native speakers of the target language. In addition, Ghasemi, Hashemi, and Bardine (2011) also identified categories of videos featured on YouTube:

1) Autos and Vehicles

2) Comedy

3) Education

4) Entertainment

5) Film & Animation

6) Gaming

7) How-to & Style

8) Music

9) News & Politics

10) Non-profit & Activism

11) People and Vlogs

12) Pet & Animals

13) Science & Technology

14) Sports

15) Travel & Events

2.1.2 Social Networking Sites

It is used to describe any website that enables users to create public profiles within that Website and form relationship with other users of the same website who access their profile.

It is used to describe community base website, online discussion forum, chat rooms and other social space online. Commonly, the phrase “social networking sites” is used as an Umbrella term for all social media and computer-mediated communication, including but Not limited to Facebook, Twitter, LinkedIn, and Myspace, as well as the inaugural social Networking sites of Cyworld, Bebo and Friendster.

Ellison and Boyd (2013) define social network sites as web-based services that allow individuals to construct profiles, display user connections, and search and traverse within that list of connections. A YouTube media is an online service or platforms that focus on facilitating the building of YouTube among people who share interest, activities and background on real life connections.

It is a website that allows users to share information within a selected group. It is a great way to stay connected and a convenient way to share photos from trips (Awake, 2012). It consists of a representation of each user (profiles), social links and a variety of additional services. For detailed analysis of YouTube networking, the following terms will be discuss

YouTube as an educational tool

YouTube in Academia

Features of YouTube site

Constraints of YouTube in Education

i. YouTube as an Educational Tool

According to (Jackman, 2019) YouTube is one of the new e-resources that can be used in contemporary tertiary education pedagogy. In addition, YouTube, considered to be the most widely used view hosting website, is also seen as a prominent contemporary e-resources with numerous benefits in the university classroom (Jackman, 2019). The research context for the present study was set within the a South African institution of higher learning and in other countries such as the United Sates it has already been established that YouTube videos are commonly used for teaching and learning (Smith, 2011; Schaper *et al*., 2014). YouTube videos can be a valuable source of content to supplement existing case teaching materials in health management and policy (Green *et al*., 2018). The relevance and use of YouTube in teaching and learning was cited by Dreon and Dietrich (2019) who pointed out positive reactions from teachers after viewing YouTube as motivation for utilizing the video streaming in an educational manner. One unique feature of YouTube is that two types of users can be clearly identified: the viewers and the content creators (de Bérail e*t al.*, 2019). Students who utilize YouTube tutorials could also be classified as content creators and users since some students upload the content for sharing purposes and other view for learning purposes. It has been found that social media fosters social learning in effective ways such that it can substitute traditional modes of instruction (Buzzetto-More, 2012; Buzzetto-More 2014). The learning approach of traditional lecture-centred classrooms is being challenged by active learning hybrid programs such as YouTube (Hund & Getrich, 2015). YouTube videos widely considered as easy to share with faculty in other fields and at other institution (Topps *et al.*, 2013) making them useful for learning purposes. Ferrer *et al.* (2011) established in their research that students from less affluent social background who had not previously received

exposure to ICT devises such as tablet PCs did not perform in class as well as students who had received prior exposure to ICT. This then re-enforces the relevance and importance of modern communications in the learning environment.

ii. YouTube in Academia

Recent advances in modern technology have created a surplus of electronic devices and e-platforms that are available to teachers at all levels (Jackman, 2019). The use of YouTube in academia has received great attention primarily in the medical academic field as indicated by literature (Clifton & Mann, 2011; Green, *et al.*, 2018; Schaper *et al.*, 2014). Su and Kuo (2010) argued that YouTube is frequently used by university students and posting information literacy videos on YouTube increases visibility but does not easily achieve a comparable accomplishment of an extensive and well structured tutorial. Numerous librarians not only build information literacy tutorials on their library websites, but also post instructional short films on video sharing sites for easy access and high visibility (Su & Kuo, 2010).

iii. Features of YouTube sites:

More than 4 billion videos are viewed daily on YouTube. Clearly, the user experience is not driving away visitors.

Yet, YouTube is set to unveil new YouTube features and improved tools aimed at making the user and creator experience even more enjoyable and beneficial. These improvements — rolling out over the course of the rest of the year – should be welcomed by small businesses that are using the video platform to market their products or brand. Here is a quick look at the new YouTube features:

i. Improved Comments

While comments are welcomed, junk comments are a distraction the majority of users, if not all don't want to see when viewing videos and sharing with like-minded people. The new ranking system is designed to lower the visibility of junk comments for a cleaner layout.

According to Kiley McEvoy, product manager at YouTube, this has resulted in lowering the rate of dislikes by more than 36 percent across YouTube.

ii. Subscriber Notifications

With billions of viewers watching videos on YouTube every single day, it is safe to say there extremely loyal followers who love their channels. Content creators can use the new subscription notification feature to let their fans know they have uploaded a new video. Fans will have access to opt in and receive notifications through their mobile and email every time a new video is published. Say good-bye to FOMO (Fear of Missing Out).

iii. New Types of Cards

Promoting your content is one way of ensuring you will keep your current users, and you increase the number of new viewers. The new types of cards will make it possible to promote other content, sell merchandise, raise funds and more. The first card is the Channel card, which will let you link the videos you create to other channels so you can share them with people you collaborate with. This interlinking can increase your presence by introducing your content to viewers you might have not considered in the past.

iv. **Easier Access to the Subs Feed**

The subscription feeds lets creators see who is making the effort to watch the content that is being produced. The new sub feed will make it easier and faster to get to the subscriptions feed and update the YouTube mobile app. With so many metrics available to measure user engagement, it will be possible to give priority or loyal customers personalized service to ensure they continue watching.

v. **A Faster, More Useful Creator Studio App**

With mobile continuing to increase as the preferred medium for consuming video content, the company is working on improvements to the Creator Studio app.

vi. **Video Management on the Go**

Video is the mainstay on YouTube, and improving its functionalities is crucial. Based on the request of users, content mobility management now has two new features. The first one is the ability to update custom thumbnails from your mobile device and the second one is, the option to enable or disable monetization on your videos, no matter where you happen to be.

vii. **360-Degree Videos**

This is one of the coolest new YouTube features. New video capturing devices such as GoPro and drone based recording means a 360-degree can add a new dimension to the content we view. The recently added 360-degree feature lets the viewer see everything that is taking place at a particular location. If that is not enough of an immersion experience, YouTube is also working on adding 3D.

viii. **Better Live Streams**

Live streaming is not only for video content. Entertainment, gaming, learning and more are part of the delivery system. Content creators, whether it be video, apps or games, will now have an easier time of setting up and managing their live streams.

The company also announced its upcoming YouTube Gaming app, which will give gamers a chance to take the improved live stream technology for a ride.

ix. New Creator Community

As a social platform, YouTube thrives on the community of users it has created. This is responsible for the success it currently enjoys. The new Creator Community will be a new online forum to encourage collaboration, share advice and give the company feedback on how to improve products and service.

x. **Updated Creator Academy**

An undeniable fact about the Internet is the way it has democratized education. Users from around the world can now access free classes from Harvard to Stanford and almost everyone in between. The Creator Academy added more than 50 lessons and features designed to find the lessons you want learn more quickly. It also makes personalized recommendation on what to learn next. YouTube says some of these new YouTube features will be available in a matter of weeks, while others will be released throughout the year after all the tweaks are finished.

Iv Constraints of YouTube in Education.

YouTube offers several positive features but this technology has some challenges as well down here I will list some of them:Firstly, YouTube simplicity in using makes the one think

that educators are no longer necessary, however it is a resource of user generated content and no quality assurance is taken so educators do still play an important role when incorporating YouTube videos and education as they need to watch the video all the way through before they show it to the class. It is important teachers not surprised with what is being displayed (Clifton and Mann, 2011).Secondly, Hossler and Conroy (2013) reported that there is a serial risk attached to user generated content in case the content related to medical misinformation. One more risk is that searching for resources may result with a wide range of finding in both type and content. There is also the possibility for this risk with student who might be looking for educational information and find in biased, and more importantly students might miss that the educational information is biased. Freeman and Chapman (2010) reported in their paper the risk of using YouTube videos as a mode of subversive advertising and pointed about the underhand tactics that companies and organization used to sponsor their products and services. So, it is clearly seen that the potential quality of learning dependent on the resources used. There is a need for researchers to be a literate in Internet and information in order to gain advantage from YouTube as learning and teaching resource. Thirdly, using YouTube in the classroom can be a challenge as well, for the reason that when locating a class-related and appropriate material in the huge storage of the online video sharing website can be time consuming and difficult. This is especially when the educator has no particular video clip in mind (Snyder and Sloane, 2014). Snyder and Sloane (2014) mentioned that to improve the search efficiency lecturer should use more appropriate descriptive key words or search for personalized YouTube pages with similar content. In the past, YouTube were viewed as a distraction and offered no educational Benefit. Blocking this social network was a form of protection for students against wasting time, bullying and privacy protection. In an educational setting, an online survey based on 9-19 years old and above discovered that students received

bulling comments online. Social networking, often include a lot of personal information posted publicly and many believe that sharing personal information and the easy communication vehicle that YouTube opens the door to sexual predators.

However, there is evidence of contradiction to this; 69% of YouTube using teens and 85% adults said people are mostly kind to one another. The national school board association reports that almost 60% of the students who use YouTube talk about educational topics online and more than 50% talk about school work. Yet the vast majority of school district has stringent rules against nearly all forms of social media during school hours. Social networking focused on supporting relationship between teachers and students which are now used for learning. Some sites like Ning-for teachers and Term wiki-learning Centre were created to support this.

YouTube are also emerging as online year book for private and public use. It allows anyone from the general public to register and connect to others. It allows participant the opportunity for just in time learning and engagement and prescribed curriculum.

2.1.3 Evolution of Education

From the days of early civilization, we are pushed through a process of learning, from one generation to another. This process of learning habits, cultures, sciences, lifestyles, and skills is defined as 'education'. Our ancestors started off their education by learning how to rub two stones to build a fire, how the leaves and barks could be used as means to cover their bodies, how to look at the sky and predict rainfall for the coming days, and so on.

Looking at society now, being educated in one or more aspects is a requirement for a profitable survival. At the age of five, a person starts his primary education to a retired person,

education takes you through an undying process. With the rising importance of being educated the cost of attaining this education doubles. Many institutions are coming up with university-affiliated degrees and so on. However, with time, the most obvious questions come up, such as 'How much could an average earner spend on his/her children's studies?' 'In a fast-paced society is it practical to attend each and every lecture moving from one course to another while balancing family and work as well?'

2.1.4 Doorway of YouTube education

Identifying the above as an opportunity from a marketing angle, few companies launched online learning programs at a cost. Among the few, YouTube, a video-sharing website now owned by Google, made a bold decision to make education freely available to those who seek it. They extended to an educational arm allowing the users to access videos of their aspect of interest at no cost. In 2011 YouTube announced that they had an 80% increase in hits on their educational videos and they believe their investment in this has been fruitful.

2.1.5. Best Educational Channels on YouTube

YouTube has mainly three categories of education, namely Primary and Secondary, University and Lifelong Learning. A few of the best educational channels on the website are explained below.

- Research Channel provides new information about the scientific world. It mainly targets the audience that would be interested in knowing information such as new gene modifications, new cures for cancer, and improvements in nanotechnology, etc. Once in a while, they let popular figures such as Bill Gates' discussions be run on this channel.

- National Geographic Channel is a must-subscribe channel on YouTube regardless of age. There are thousands of videos that could answer many curious questions in one's mind.
- Sometimes, being bombarded by information could easily bore you, yet the Discovery channel has a twist to it. The channel provides educational information with the flair of entertainment and fun, which makes the channel more interesting letting itself stand out among the other channels.
- The Khan Academy is also another popular website initiated in 2006 by a well known celebrity, Salman Khan. This website provides over 4000 micro-lessons with useful information doing justice to their aim of providing high-quality education anytime anywhere. Yet, there are a few critics claiming that the website has been less interactive recently, however, the benefit of the channel is indisputable.

Discussed above are only a few of the top educational channels on YouTube, but we all know there are many more. Personally having written this, I too realized the importance we should give in educating ourselves when information is readily available for free just one click away. After all, we reap what we sow Isn't it? We invest our time and we gain knowledge in less than double proportion.

2.1.6 Benefits of YouTube

Though many arguments can be made about the possible risks of adolescent use of YouTube. It is important to point out the benefits of this website as well. Many schools have started to use these sites to promote education, keep students up to date with Assignments, and offer help to those in need.

In general, the YouTube sites can be a positive influence on adolescents. Social networking sites (YouTube) provide an outlet for teens to express themselves in their own unique ways (Boyd, 2017).

In addition, they serve both as a meeting place for teens to interact with other like-minded people and as showplaces for teens artistic and musical abilities (Boyd, 2017). Finally, high school students use these sites as tools to obtain information and resources for graduation preparation and future planning. For example, students applying for college visit profiles of the college's students to view pictures and read blogs of past students to determine whether the college would be a good fit (Boyd & Ellison, 2017).

The use of YouTube increased effort of students in class by 38% to some extent. Almost half the respondents were neutral on whether the use of YouTube increased their effort in class. In the current sample, 55% of respondents agreed to some extent that the use of YouTube had increased their interest in the coursework.

2.1.7. The Pros of YouTube in Education

1. **It is free**.

Anyone can have access to YouTube whenever they want to have it. This makes it a usable tool for any teacher that happens to be on a tight budget. No matter where you are in the world, you can access the videos that are uploaded for educational purposes without even the need to have a Google account created.

2. **It can be used anywhere.**

Teachers don't have to be tied to a specific location in order to upload helpful videos for their students. This means that as long as there is an internet connection, there is the ability to upload a video to students anywhere in the world. It makes YouTube a particularly useful tool for courses that are designed for distant learning.

3. **It can be used as a supplemental resource.**

The videos that are on YouTube can be used in a classroom environment to supplement the key points a teacher is talking about. It may be a way to offer additional information, show a real-world example, or be a visual method of taking students through the step-by-step solution for a problem they need to solve.

4. **It extends the classroom setting into the home**.

Not every family can afford a tutor. Not every student is able to complete their homework assignments on their own. With YouTube, a teacher can upload reference videos, lectures, and even replays of what happened in class so that the information can be thoroughly studied and retained.

5. **It offers multiple learning options for the same task.**

Some people work better through visual components. Others learn better by directly reading the information that needs to be retained. With YouTube, educators have the option to provide multiple methods of showing a problems resolution so that every student is able to learn in a way that best suits their needs.

6. YouTube can be a network of sorts for teachers.

Not every teacher has the ability to create and upload videos that are based on their curriculum. Yet if just one teacher has found this time, every other teacher who teaches the same concept or curriculum can use that media as a resource for their classroom. This allows teachers to connect with and support one another in a very unique way.

7. Videos can be re-watched as often as needed.

In a classroom setting, a student may not have the opportunity to have a key point repeated if they didn't retain the information the first time around. On YouTube, there are no limits.

2.1.8. The Cons of YouTube in Education

I. **Not every video on YouTube is reliable**.

Fake news isn't just a problem on Facebook. There are numerous videos that are uploaded every day that come from questionable sources. Some videos are designed to sell products or promote a personal agenda. It can take some time to sort the real videos from the unreliable ones and that is an investment that not every educator is in a position to make.

II. Some content in videos may not be suitable for the age group.

Let's just be honest: some videos on YouTube are not suitable for children. This includes videos that are intended for a younger audience. This particular key point may not apply to high school or college-level courses, but should be considered for any educators that teach young children. It is for this very reason why YouTube hasn't been in education for several years.

III. **You need to have an internet connection to access it.**

If you don't have a cellular data connection and there isn't an internet connection in a classroom, then there is no way to utilize YouTube for education. There has to be some level of online connectivity in order for this to work. If one does not exist, all of these key points are rather moot

IV. **Videos often have advertisements**.

And some of those advertisements can be very lengthy without an option to skip them. These ads may also not be appropriate for the content that is being taught. The pros and cons of YouTube in Education show that it can be an especially meaningful way to connect with students. As long as the negatives are managed in an effective way, there are many positive outcomes that can be obtained.

2.1.9. The Most Popular YouTube Video Challenges

The Eat It or Wear It Challenge

Try Not to Laugh

The Whisper Challenge

Speed Drawing

Touch My Body

Chubby Bunny

Innuendo Bingo

The Cinnamon Challenge

Say Anything

Bean Boozled Challenge

The Disney Challenge

Ghost Pepper Challenge

Last to Leave

Below show the explanations of the above listed items:

1. Eat It or Wear It Challenge

A challenge that takes taste-testing is another level. This game is messy but fun if you can handle putting disgusting things in your mouth.

Objective: From a pile of closed bags with numbers on them, choose one and either eat the food inside or "wear" it. The winner is the one who wears it least.

2. Try Not to Laugh

Accessible and suitable for all ages. The challenge is exactly what it sounds like, yet oddly enough the more you try, the harder it gets.

Objective: Survive a series of funny YouTube clips (or 6 second vines) without laughing (or smiling, depending on how you want to play).

3. The Whisper Challenge

I love watching people play this game because of the extreme randomness of what they say. The results are hysterical, unexpected, and so much fun to watch.

Objective: Try to read lips and figure out what the person is saying while you wear headphones blasting loud music.

4. Speed Drawing

Anyone can play this challenge, and it's a fantastic way to think quickly on your feet. Objective: You and a few others draw pictures within a short time span (usually 1-2 minutes), and the winner is the one whose drawings are the best.

5. Touch My Body

This is the most intimate of the challenges on this list, if you couldn't already guess from the name. That's why couples or members of the opposite sex engage in it.

Objective: One person is blindfolded and the other places the blindfolded person's finger onto one of their body parts. The one that can't see has to guess what the body part is.

6. Chubby (or Fluffy) Bunny

This is another oldie challenge that was common at sleepovers. It's had a second life on YouTube. Warning: Choking hazard: Be extremely careful if you do this challenge.

Objective: Common rules call for each player to take a marshmallow, put it in their mouth (don't chew, eat or swallow), and say "Chubby Bunny" before moving on to the next person.

7. Innuendo Bingo

A messy challenge that's only as dirty as your mind.

Objective: Try not to laugh while keeping liquids in your mouth.

8. Cinnamon Challenge

This is an older challenge and is one that I don't care for at all, but I'll mention it because of how notorious it was. It may have even sparked the entire YouTube challenge/collaboration movement that's so popular today.

Objective: You have to eat a spoonful of cinnamon to see if you can handle it. (Spoiler alert: You can't.)

9. Say Anything

How could saying something be so hard?

Objective: You'll need a minimum of two people but several can play (more difficult). The goal is to say any word when it's your turn to speak, as long as you don't repeat a word someone has said in that round.

10. Bean Boozled Challenge

Based on the Harry Potter classic chewy delight, this jelly bean challenge tests your taste buds with a mix of good and terrible flavors.

Objective: Spin the wheel and see which color jelly bean you get, but watch out because one of them is good while the other is disgusting.

11. The Disney Challenge

What is the Disney challenge?

Objective: Two people have to listen to a series of Disney songs (mostly animated) and guess the song's name and movie origin within 7-10 seconds of the intro.

12. The Ghost Pepper Challenge

This is a highly challenging albeit dangerous challenge involving the ingestion of the famous ghost pepper or in extreme cases the Carolina Reaper to see how long you can last against the heat.

Objective: The goal is very simple. How you play varies but the end result will test your endurance with the taste-testing of one of the hottest peppers on Earth.

13. Last to Leave

Popularized recently by MrBeast, these challenges test your endurance and patience to be the last one standing. However, there are plenty of alternative versions including the last to leave the circle, the last to let go of an object, the last to let go of a button, etc.

Objective: Usually takes place in a small location where a group of people must stay in one spot for as long as possible.

2.2. Theoretical Framework

The theoretical framework for this study was built upon models which focused on Technology and learner autonomy. The model is Technology Acceptance Model (TAM), which was first introduced by Davis in 1986. Technology acceptance can be defined as the learner's willingness in using technology for "the tasks it is designed to support" (Teo *et al.*, 2011). In addition, TAM is specifically tailored for modeling user acceptance of information systems. TAM is specifically designed for the purpose of explaining computer usage behavior. In TAM, a user's behavioral intention to use an information system reflects the user acceptance of the system (Lee & Lehto 2013). The primary goal of TAM is to provide an explanation of the determinants of computer acceptance that is general. Its goal also includes explaining user behavior across a broad range of end-user computing technologies and user populations. TAM hypothesizes that two particular beliefs; perceived usefulness and perceived ease of use, are of primary relevance for computer acceptance behaviors, as shown in the figure below:

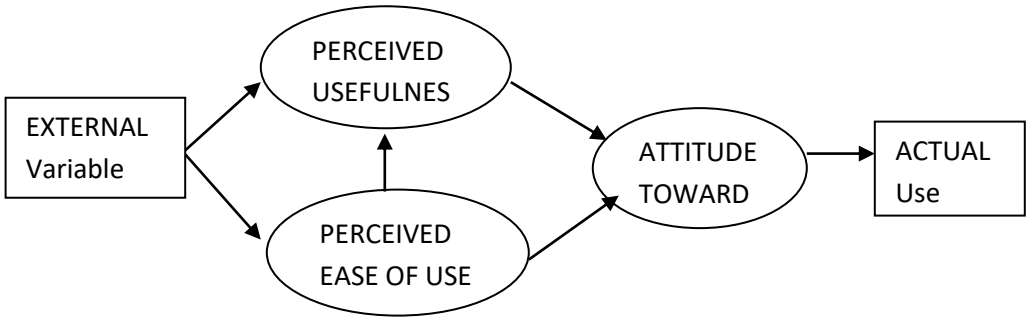

Figure 1: Technology Acceptance Model (Davis, Bagozzi, and Warshaw 1989)External variables refer to influences that ESL learners receive in using YouTube in their independent language learning. These influences include those from teachers, social, and within themselves. Perceived usefulness (U) is identified as the user's belief that his or her performance will be increased by using a specific application system. This means that when students perceive that independent chemistry learning through YouTube videos can help to improve, they are more likely to use YouTube videos in their learning process. On the other hand, Perceived Ease of Use (PEOU) refers to "the degree to which the user expects the target system to be free of effort" (Davis *et al.*, 1989).In this context, PEOU refers to students' perception about the degree of effort needed to use YouTube in independent chemistry learning.

2.2.1. The Importance of YouTube in Education

Online education is becoming virally spreading across every corner. Many students and even lecturers are moving away from the traditional methods of studying and teaching. Comparing the education systems about 10-15 years back to the present times, many students are given assignments to research on, topics discussed in class, and many write-ups to provoke out-of-the-box thinking plus self-learning. With the developed technology and a generation moving away from physical pen and paper to mobile, tab, palmtop, etc., access to online education looks more practical and a timely solution. Solution providers such as YouTube have taken the responsibility of helping our generation move forward in this manner.

2.3.1 Empirical Studies

A lot of studies related to the topic and the use of videos or YouTube videos in learning process had been done by various researchers. A large-scale survey by Canning-Wilson (2000)

revealed that students liked learning chemistry through videos. One of the results showed that learners preferred action or entertainment films than language films or documentaries. Meanwhile, Stepp□Greany (2002) studied students' perceptions on technological environment

learning. The results showed that students attributed an important role to instructors. The results also indicated that students perceived enhancement in cultural knowledge, listening and reading skills, and independent learning skills. In a study done by Bordonaro (2003), it looked into the advanced chemistry learners' preparetion on using technology for learning. The findings revealed that advanced chemistry learners did not use computer tools designed explicitly for pedagogical purposes extensively, and learner autonomy was not often manifested in the advanced chemistry learners' successful self-directed learning. In a study done by Kelsen (2009), he explored the students' attitudes towards using YouTube to study chemistry. The data showed that the students rated the use of YouTube to study chemistry as interesting, relevant, and beneficial. The students also responded by writing positive comments regarding the use of YouTube in chemistry learning. Anyagre and Anyagre (2009) reported that there are three roles of video in teacher education. The first role of video is as an additional and variety to the teaching-learning environment. It also has a special appeal especially with visual learners. Secondly, videos can be used to "provide a common experience for immense learning through discussion" (Anyagre and Anyagre 2009). Then, the usage of videos in teacher education allows students to involve in problem-solving activities. The last role of videos that they reported is that videos can be used to train the student-teachers on media literacy.Alimemaj (2010) conducted a study on YouTube, language learning, and teaching techniques. The data obtained from the students implied that the Internet and YouTube were great potential resources for chemistry learning. In addition,

students had positive ideas in using YouTube for their own language learning. In another study of 'L2 Stories about YouTube in chemistry Learning' by Balcikanli (2011), the results from the study concluded that the students took advantage of YouTube for the purpose of enhancing their language proficiency and out-of-class experience, especially in terms of independence skills and cultural competence. Watkins and Wilkins (2011) studied 'Using YouTube in the EFL Classroom' and the study concluded that conversation, listening, and pronunciation skills can be enhanced by using YouTube; inside and outside the classroom. Moreover, the study also suggested that using YouTube videos as realia stimulates cultural lessons, exposes students to World chemistry, and helps promoting authentic vocabulary development.

In a study done by Muniandy and Veloo (2011) which focused on Malaysian context of using video clips in chemistry teaching, the result showed that the use of online video clips were highly accepted by pre-service teachers and they showed very strong attitude and readiness to utilize video clips in their teaching. Another study had been conducted in 2011 in upper secondary school studies in Malaysia in order to investigate whether there would be a change in students' competence when they were exposed to in YouTube, compared to students who were exposed to the traditional approach. The respondents in this study were divided into two groups; experimental group and control group. Based on the data Obtained, the results showed that there was a significant improvement in students' competence when they were exposed to in YouTube, compared to students who were exposed to the traditional approach. The respondents in this study were divided into two groups; experimental group and control group. Based on the data obtained, the results showed that there was a significant improvement in students' competence in the experimental group than those in the control group.

In a different study, Jarvis (2012) studied the practices and perceptions of Thai and Emerati university students in using computer-based materials (CbMs) outside the classroom, including Self Access Centres (SACs). The data suggested that students used wide range of materials regularly and extensively. The results also indicated that the students were aware of the importance of accessing and transmitting information in chemistry. They appeared to be using CbMs considerably for the purpose of exposure to and the unconscious acquisition of the chemistry.

In 2013, DeWitt, Zahra Naimie, and Saedah Siraj carried out a study for the purpose of finding out the technology applications that the first year undergraduate students in a public institution in Malaysia had utilized. According to the results, majority of the respondents which comprised of 97.2% used YouTube in their daily life. Meanwhile, another study had been conducted in 2013 to 20 lecturers and trainers of the Academy of Arts, Culture, and National Heritage (ASWARA) in order to investigate the advantages of using YouTube as a teaching and learning tool in the performing arts, as well as to determine whether it would be appropriate to use YouTube as a performing arts teaching tool in future. The results revealed that YouTube had the potential to be an instructional tool in the performing arts due to the consensus from the respondents, who were experts in the field.

In another study conducted by Norhatta Mohd and Siti Mistima Maat (2013) which was done to Engineering Technology students for the purpose of investigating ICT application, which involved YouTube, that they used in learning mathematics. Based on the findings, the students referred to YouTube as a learning material in enhancing their understanding. In addition, the students also used YouTube in order to help solving some of their mathematics problems.

2.4. Summary of Literature Review

There are many issues concerning students in Federal University of technology Minna, and YouTube site participation. On one hand, there may be benefits for students who use these sites properly and appropriately. Other research suggests that there are clear risks involved when students become too consumed with the Internet and YouTube websites. It was discovered that YouTube sites are the most common used social media networks among students and also Wikipedia has the main resort point for students for research purposes. Students engage themselves with one activity or the other on the various Internets on day to day activities.

However, Undergraduates spend more time on YouTube and other social media through smart phones that are now in abundance among these youths. Many students cannot go for two-three hours without checking internets even at the detriment of other activities such as educational and career pursuit. Smart phones, android phones as well as tablets were seen to be the major ways through which students gain easy access to the internet to be on the various social media network platforms. Cell phones have been banned from classroom and schools have blocked many popular social media websites due to the repercussion the YouTube might have on the academic.

Hence, for the purposes of this research project, the researcher will examine how YouTube can be used in schools to promote quality instruction, and how this will create awareness in their academic studies. At the conclusion of this research project, there will be a better understanding regarding students in FUTminna and whether or not they are able to balance a life of YouTube in teaching chemistry and academic perfor

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter dealt with research methodology. It describe the Research Design, Population of the Study, Sample and Sampling Technique, Research Instructment, Validity, Reliability ,Method of Data Collection, Method of Data Analysis.

3.1 Research Design

This research employed descriptive survey research design. Descriptive survey research design is a method of collecting information by interviewing or administering a questionnaire to a sample of individuals (Orodho, 2003).This study aimed at collecting information from students of federal university of technology, Minna on the preparedness, awareness and utilization of YouTube in teaching chemistry among science education students in FUTminna.

3.2 Population of the study

The research population for this study was drawn from the Department of sciences Education Bosso campus FUTminna. The target population of this study was students of FUTminna. There are three Options in the department which include chemistry education, mathematics education, and Biology education in FUTminna. The approximate population of students in the Department is 473 students.

3.3 Sample and Sampling techniques.

The representing samples of science education were made. Simple random sampling was used to select 500level students

3.4 Research Instrument

The instrument developed by the researcher for the data collection is questionnaire. Questionnaire items were constructed to afford answer to the research question formulated to guide the study. The questionnaire consists of two sections. Section one sought information on personal data while second sections contain thirty (3o) items structure to provide answer to the major research question. Four (4) point scale rating of highly prepared, Aware and often. Moderately prepared, aware and often. Not prepared, aware and often. Highly not prepared, aware and often.

3.5 Validation of Research Instrument

The instrument was validated by two Lecturers from Science Education Department, Federal University of Technology Minna. They all examined the instrument in terms of level of language of expression, ambiguity, duplication of statement, relevance of items to research purpose and research questions and the adequacy of the items among others. The comments and suggestions of the Validates were used in the production of the final copy of the instrument for data collection.

3.6 Reliability of Research Instrument

Reliability of research instrument is very essential that measures the consistency of the instrument. A pilot test was conducted from the research instrument. The instrument was

tested using 20 number of questionnaire. The administered questionnaire was collected back and analyzed by cronbach Alpha formulae and reliability coefficient of r =0.72 was obtained for the items. This value obtained as indicated by Akande et.all (2009) was reliable.

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 in order to come up with proper report.

3.8 Method of data Analysis.

The data collected in the study were analyzed using mean and standard deviation. The responses from the respondents were compared, classified to the number of items in the questionnaire for each research question. The nominal values assigned to the different scaling items used are as follows, highly prepared, highly aware and very often = 4, moderately prepared, moderately aware and often =3, not prepared, not aware and not often= 2, highly not prepared, highly not aware and highly not often = 1.

CHAPTER FOUR

PRESENTATION OF DATA ANALYSIS

4.1 Research Question 1:

What is your level of preparedness towards the use of YouTube in teaching chemistry?

***Table* 4.1:** Mean respondents of Science Education students of FUTMinna on students' level of preparedness towards the use of YouTube in teaching chemistry**.**

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

S/N	Items	N	Mean	Sd	Remark
Q1	How prepared are you to use YouTube in teaching chemistry	90	2.59	0.66	Moderately prepared
Q2	How prepared are you to use YouTube for creating classes.	90	2.47	0.68	Moderately prepared
Q3	How prepared are you to use YouTube for learning.	90	2.44	0.50	Moderately prepared
Q4	How prepared are you to use YouTube for creating assignment.	90	2.79	0.51	Moderately prepared
Q5	How prepared are you to use YouTube as learning initiative and motivation booster	90	2.81	0.83	Moderately prepared

Q6	How prepared are you on recommending YouTube for other appropriate subjects	90	2.53	0.00	Moderately prepared
Q7	How prepared are you to use YouTube as a grading system in monitoring the understanding of current topic discussed	90	2.41	0.51	Moderately prepared
Q8	How prepared are you to use YouTube for interaction with other students	90	2.36	0.64	Moderately prepared
Q9	How prepared are you to make YouTube user friendly	90	2.67	0.51	Moderately prepared
Q10	How prepared to make YouTube friendly among science Education students	90	2.90	0.75	Moderately prepared
Score	**Grand mean**		**2.60**	**0.56**	

Key: **=** Average of responses of Science Education students of FUTMinna**N =** Number of Science Education Students of FUTMinna

The result presented in ***table*** **4.1** above revealed that the respondents (Science Education Students of FUTMinna) agreed with all the itemsto have a moderately preparation towards the use of YouTube in teaching chemistry. This implies that all the entire preparation parameters itemized towards the use of YouTube in teaching chemistry are moderate

4.2 Research Question 2:

What is your level of awareness in teaching chemistry using YouTube among science Education Students?

***Table* 4.2:** Mean respondents of Science Education students of FUTMinna on students' level of awareness in teaching chemistry using YouTube among science Education Students.

N = 90; Highly Aware **(HA);** Moderately Aware **(MA);** Aware **(A);** Not Aware

S/N	Items	N	Mean	Sd	Remark
Q1	I'm aware that; using YouTube in learning Chemistry independently is easy..	90	2.57	0.78	Moderately Aware
Q2	I'm aware that; YouTube provide variety of videos for learning Chemistry	90	2.45	0.60	Moderately Aware
Q3	I'm aware that; utilization of YouTube videos encourages active learning	90	2.42	0.56	Moderately Aware
Q4	I'm aware that; YouTube provide easy access to videos on different aspects of Chemistry	90	2.77	0.91	Moderately Aware
Q5	I'm aware that; YouTube videos can be re-watched as often as needed	90	2.43	0.94	Moderately Aware
Q6	I'm aware that; YouTube provide a platform for interaction among learners	90	2.51	0.87	Moderately Aware
Q7	I'm aware that; YouTube videos can be accessed anywhere	90	2.39	0.74	Moderately Aware
Q8	I'm aware that; YouTube extend the classroom setting into the home	90	2.34	0.65	Moderately Aware

Q9	I'm aware that; YouTube can perfectly supplement traditional classroom	90	2.65	0.80	Moderately Aware
Q10	I'm aware that; YouTube offer multiple learning option for the same task	90	2.86	0.65	Moderately Aware
Score	**Grand mean**		**2.54**	**0.75**	

Key: = Average of responses of Science Education students of FUTMinna**N** = Number of Science Education Students of FUTMinna

The result presented in ***table* 4.2** above revealed that the respondents (Science Education Students of FUTMinna) agreed with all the items indicating their *moderately awareness*of teaching chemistry using YouTube among science Education Students. This indicates the general awareness of Science Education Students of FUTMinna in teaching chemistry using YouTube.

4.3 Research Question 3:

What is the level of utilization of YouTube in teaching chemistry among science education students?

***Table* 4.3:** Mean respondents of Science Education students of FUTMinna on students' level of utilization of YouTube in teaching chemistry among science education students**.**

N = 90;Very Often (VO); Often (O); Moderately Often (MO); Not Often (NO)

S/N	Items	N	Mean	Sd	Remark
Q1	I utilize YouTube videos to enhance my communication in chemistry.	90	2.69	0.66	Often

Q2	I utilize YouTube videos in my learning time to enhance the effectiveness of my studies of chemistry.	90	2.57	0.68	Often
Q3	I utilize YouTube videos to improve the quality of my assignments in Chemistry.	90	2.54	0.50	Often
Q4	I utilize YouTube videos to accomplish studies task more easily in Chemistry.	90	2.89	0.51	Often
Q5	I utilize YouTube videos to learn Chemistry independently	90	2.55	0.83	Often
Q6	I utilize YouTube videos to learn new concepts in Chemistry	90	2.63	0.00	Often
Q7	I utilize YouTube to learn correct solutions to chemistry problems	90	2.51	0.51	Often
Q8	I utilize YouTube to share my knowledge of Chemistry with others	90	2.46	0.64	Often
Q9	I utilize YouTube videos to improve my derivative skills.	90	2.77	0.51	Often
Q10	I utilize YouTube videos in my learning time to improve my learning productivity in Chemistry	90	2.98	0.73	Often
Score	**Grand mean**		**2.55**	**0.56**	

Key: = Average of responses of Science Education students of FUTMinna**N** = Number of Science Education Students of FUTMinna

The result presented in ***table* 4.3** above revealed that the respondents (Science Education Students of FUTMinna) agreed with all the items indicating their *often* utilization of YouTube in teaching chemistry. This implies that all the entire preparation parameters itemized towards the use of YouTube in teaching chemistry are moderate.

4.4 Discussion of Findings

The discussion of findings based on the research question of the study.

The finding revealed that the respondents (Science Education Students of FUTMinna) agreed with all the items to have a moderately preparation towards the use of YouTube in teaching chemistry. The following are preparation parameters itemized towards the use of YouTube in teaching chemistry are moderate: The usage of YouTube in teaching chemistry; The usage of YouTube for creating classes; The usage of YouTube for learning; The usage of YouTube for creating assignment; The usage of YouTube as learning initiative and motivation booster; The usage of recommending YouTube for other appropriate subjects; The usage of YouTube as a grading system in monitoring the understanding of current topic discussed; The usage of YouTube for interaction with other students; The usage of YouTube for friendly interaction; The usage of usage of YouTube for friendly among science Education students.

The finding revealed that the respondents (Science Education Students of FUTMinna) agreed with all the items indicating their *moderately awareness* of teaching chemistry using YouTube among science Education Students. This following are the general awareness of Science

Education Students of FUTMinna in teaching chemistry using YouTube: YouTube in learning Chemistry independently is easy; YouTube provide variety of videos for learning Chemistry; YouTube videos encourages active learning; YouTube provide easy access to videos on different aspects of Chemistry; YouTube videos can be re-watched as often as needed; YouTube provide a platform for interaction among learners; YouTube videos can be accessed anywhere; YouTube extend the classroom setting into the home; YouTube offer multiple learning options for the same task; YouTube can perfectly supplement traditional classroom. All this are in accordance with (Jackman, 2019) emphasizing that YouTube is one of the new e-resource that can be used in contemporary tertiary Education pedagogy. In addition, YouTube, considered to be the most widely used view hosting website, is also seen as a prominent contemporary e-resources with numerous benefits in the university classroom (Jackman, 2019).

The finding revealed that the respondents (Science Education Students of FUTMinna) agreed with all the items indicating their *often* utilization of YouTube in teaching chemistry. The following are the usage of YouTube in teaching chemistry among science education students: to enhance communication in chemistry; to improve learning productivity in Chemistry; to enhance the effectiveness of studies of chemistry; to improve the quality of assignments in Chemistry; to accomplish studies task more easily in Chemistry; to learn Chemistry independently; to learn new concepts in Chemistry; to learn correct solutions to chemistry problems; to share knowledge of Chemistry with others; to improve derivative skills. This is in line with (de Bérail, Guillon & bungener, 2019) stating that students who utilize YouTube tutorials could also be classified as content creator and users since some students upload the content for sharing purposes and others view for learning purpose.

4.5 Summary of Findings

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

Finding that related to the level of preparedness towards the use of YouTube in teaching chemistry

The finding revealed that the respondents (Science Education Students of FUTMinna) agreed with all the items to have a moderately preparation towards the use of YouTube in teaching chemistry. The following are preparation parameters itemized towards the use of YouTube in teaching chemistry are moderate:

The usage of YouTube in teaching chemistry

The usage of YouTube for creating classes

The usage of YouTube for learning

The usage of YouTube for creating assignment

The usage of YouTube as learning initiative and motivation booster

The usage of recommending YouTube for other appropriate subjects

The usage of YouTube as a grading system in monitoring the understanding of current topic discussed

The usage of YouTube for interaction with other students

The usage of YouTube for friendly interaction

The usage of usage of YouTube for friendly among science Education students

It was revealed that there is no significant difference in the Mean response of Science Education students of FUTMinna on students' level of awareness in teaching chemistry using YouTube among science Education Students.

Finding that related to the students' level of awareness in teaching chemistry using YouTube among science Education Students

The finding revealed that the respondents (Science Education Students of FUTMinna) agreed with all the items indicating their *moderately awareness* of teaching chemistry using YouTube among science Education Students. This following are the general awareness of Science Education Students of FUTMinna in teaching chemistry using YouTube:

YouTube in learning Chemistry independently is easy.

YouTube provide variety of videos for learning Chemistry

YouTube videos encourages active learning

YouTube provide easy access to videos on different aspects of Chemistry

YouTube videos can be re-watched as often as needed

YouTube provide a platform for interaction among learners

YouTube videos can be accessed anywhere

YouTube extend the classroom setting into the home

YouTube offer multiple learning options for the same task

YouTube can perfectly supplement traditional classroom

Finding that related to the level of utilization of YouTube in teaching chemistry among science education students

The findingrevealed that the respondents (Science Education Students of FUTMinna) agreed with all the items indicating their *often* utilization of YouTube in teaching chemistry. The following are the usage of YouTube in teaching chemistry among science education students:

to enhance communication in chemistry

to improve learning productivity in Chemistry

to enhance the effectiveness of studies of chemistry.

to improve the quality of assignments in Chemistry

to accomplish studies task more easily in Chemistry

to learn Chemistry independently

to learn new concepts in Chemistry

to learn correct solutions to chemistry problems

to share knowledge of Chemistry with others

to improve derivative skills.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

This study analyses the preparedness, awareness and utilization of YouTube in teaching chemistry among science Education students in FUTMinna. The research work has three objectives, three research questions, the population of the study is 473 and 90 as population of science Education department in FUTMinna which was determine by simply random sampling technique. The researcher developed a self designed four liker scale questionnaire, the instrument was validated by two expect in the department and reliability of instrument was determined using cronbach's Alpha formula. The data obtained from respondent was analyzed using mean and standard deviation. Findings of this research revealed that respondent agreed with all items to have a moderately preparation toward the use of YouTube in teaching chemistry. It is also revealed that the respondents agreed with all the item indicating their moderately awareness in teaching chemistry using YouTube. It also revealed that the respondents agreed with all items indicating their often utilization of YouTube in teaching chemistry.

5.2 Major Finding of the study

1. There was moderately preparation toward the use of YouTube in teaching chemistry.
2. There was moderately Awareness toward the use of YouTube in teaching chemistry.
3. There was Often utilization of YouTube in teaching chemistry.

5.3 Conclusion

Findings of this research revealed that respondent agreed with all items to have a moderately preparation toward the use of YouTube in teaching chemistry.

It is also revealed that the respondents agreed with all the item indicating their moderately awareness in teaching chemistry using YouTube. It also revealed that the respondents agreed with all items indicating their often utilization of YouTube in teaching chemistry.

5.4 Recommendation

Based on the findings of the study the following recommendations were made:

School administrators should provide wireless network within the school to help students to easily access YouTube during their learning time.

University lecturers and teachers should create and upload more educational contents on YouTube to ease learning.

University lecturers should be encouraged to interact with the undergraduate students on YouTube for instance having a group on YouTube platform where they exchange views about a particular subject even when they are on holiday. This will in turn encourage the use of YouTube to improve students 'academic performance.

5.5 Suggestion for Further Study

Further studies could take into consideration other locations since this study was only limited to one location.

Further studies could also consider other science subjects since this study was limited to teaching of chemistry.

Further research may perhaps consider using a qualitative method since this study utilized a quantitative method perhaps a different result from the one obtained in this study may be achieved.

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APPENDIX

Preparedness, awareness and utilization of YouTube in teaching chemistry among science Education students in Futminna

Dear Respondent,

Please feel free to indicate your choice by putting a tick in the checkbox. 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 prepared (HP), prepared (P), not prepared (NP), highly not prepared (HNP).

What is your level of preparedness towards the use of YouTube in teaching chemistry?

S/N	Statements	HP	P	NP	HNP
1	How prepared are you to use YouTube in teaching chemistry				
2.	How prepared are you to use YouTube for creating classes				
3.	How prepared are you to use YouTube for learning				
4	How prepared are you to use YouTube for creating assignment				
5	How prepared are you to use YouTube as learning initiative and motivation booster				

6	How prepared are you on recommending YouTube for other appropriate subjects				
7.	How prepared are you to use YouTube as a grading system in monitoring the understanding of current topic discussed				
8.	How prepared are you to use YouTube for interaction with other students				
9	How prepared are you to make YouTube user friendly				
10	How prepared to make YouTube friendly among science Education students				

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

What is your level of awareness in teaching chemistry using YouTube among science Education students

S/N	**Statements**	**HA**	**A**	**NA**	**HNA**
1.	I'm aware that; using YouTube in learning Chemistry independently is easy.				
2.	I'm aware that; YouTube provide variety of videos for learning Chemistry				
3.	I'm aware that; utilization of YouTube videos encourages active				

	learning				
4.	I'm aware that; YouTube provide easy access to videos on different aspects of Chemistry				
5.	I'm aware that; YouTube videos can be re-watched as often as needed				
6.	I'm aware that; YouTube provide a platform for interaction among learners				
7.	I'm aware that; YouTube videos can be accessed anywhere				
8	I'm aware that; YouTube extend the classroom setting into the home				
9.	I'm aware that; YouTube offer multiple learning options for the same task				
10.	I'm aware that; YouTube can perfectly supplement traditional classroom				

Please kindly tick the appropriate column on your personal Assessment whereas, very often (VO), Often (O), moderately often (MO), no often (NO).

What is the level of utilization of YouTube in teaching chemistry among science education students?

S/N	**Statement**	**VO**	**O**	**MO**	**NO**

	I utilize YouTube videos to enhance my communication in chemistry				
	I utilize YouTube videos in my learning time to improve my learning productivity in Chemistry				
	I utilize YouTube videos in my learning time to enhance the effectiveness of my studies of chemistry.				
	I utilize YouTube videos to improve the quality of my assignments in Chemistry				
	I utilize YouTube videos to accomplish studies task more easily in Chemistry				
	I utilize YouTube videos to learn Chemistry independently				
	I utilize YouTube videos to learn new concepts in Chemistry				
	I utilize YouTube to learn correct solutions to chemistry problems				
	I utilize YouTube to share my knowledge of Chemistry with others				
	I utilize YouTube videos to improve my derivative skills.				

THANK YOU