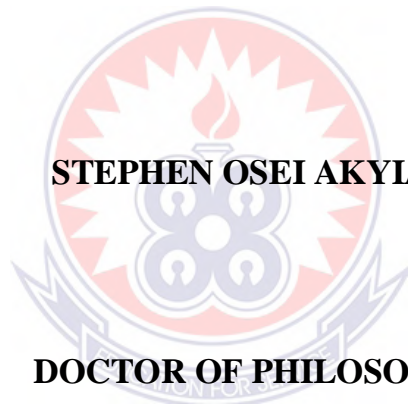


**UNIVERSITY OF EDUCATION, WINNEBA**

**CONCEPTUALISATION AND PRODUCTION OF CULTURALLY-  
INSPIRED 3-DIMENSIONAL ANIMATION: A FOOTPATH FOR  
ENHANCED AWARENESS CREATION OF MALARIA PREVENTION  
IN EFFUTU COMMUNITIES**



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**DOCTOR OF PHILOSOPHY**

**UNIVERSITY OF EDUCATION, WINNEBA**

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INSPIRED 3-DIMENSIONAL ANIMATION: A FOOTPATH FOR  
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IN EFFUTU COMMUNITIES**



**A thesis in the Centre for Research in Culture and Creative Arts,  
School of Creative Arts, submitted to the School of Graduate  
Studies, in partial fulfilment  
Of the requirements for the award of the degree of  
Doctor of Philosophy  
(Arts and Culture)  
In the University of Education, Winneba**

**MAY, 2025**

## DECLARATION

### Student's Declaration

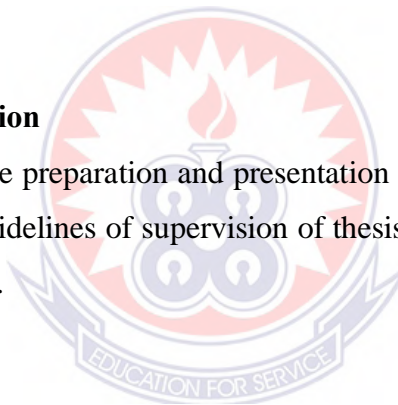
I, Stephen Osei Akyiaw, declare that this thesis, except quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my original work, and it has not been submitted, either in part or whole, for any degree elsewhere.

**Signature:** .....

**Date:** .....

### Supervisor's Declaration

I hereby declare that the preparation and presentation of this work were supervised in accordance with the guidelines of supervision of thesis as laid down by the University of Education, Winneba.



**Ebenezer Acquah, PhD (Principal Supervisor)**

**Signature:** .....

**Date:** .....

**Professor Joseph Essuman, PhD (Co-Supervisor)**

**Signature:** .....

**Date:** .....

## **DEDICATION**

This thesis is firstly dedicated to the Almighty God for seeing me through this journey successfully and in good health. It is further dedicated to my parents (Mr. Osei Agyemang Badu and Mrs. Dorothy Brako Osei), Mr. Frederick P. Mensah, all my siblings and friends.

## ACKNOWLEDGEMENTS

I express my sincerest appreciation to the Management of Effutu Municipal Health Directorate, Winneba Municipal Hospital and Trauma and Specialist Hospital for supporting me throughout this study. Your assistance in providing the study with the Malaria cases recorded in your outfits and giving me access to interview your staff hugely contributed to the successful completion of this thesis. Another gratitude goes to the Health Officers who willingly opted to serve as participants for this study. Your contributions during the pre-production stage, production stage and post-production stage of this study directed this research. I say thank you for all your efforts. My other gratitude goes to the community folks who agreed to also participate in this study. Your collaboration and responses guided this study to its successful end. I greatly appreciate Mr. Rock Nyarko Hanson of Pixil Motion Studios, Mr. Jesse Sunkwa-Mills of Mills Media Limited and Stephen Noa of Gazy Media for your guidance and support. Without your supports, this study would not have been completed. Your massive and timely support helped the rendering of the animation for this study to be completed after several struggles. I further appreciate Dr. Stephen Nyanteh Ayesu for helping with the composition of the background sound used in the animation and the voice recording. Thank you to Mr. Henry Blewushie for taking charge of the voice over recording. I also appreciate the support of my Research Assistants, Kelvin Lartey, Bright Lartey, Emmanuel Graves and Louis Hamilton for your continuous contribution. My earnest gratitude to the Head and staff of Department of Music Education, University of Education, Winneba. Lastly, I really appreciate the marvelous, massive support and encouragement of my supervisors Dr. Ebenezer Acquah and Dr. Joseph Essuman. Your collaborative supervision, guidance, tuition and suggestions throughout this period shaped this study. The success of this study cannot be rated without your enormous supervision. God bless you.

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## DEFINITION OF TERMS

**2D Animation** is the art of creating movement in a two-dimensional space.

**3D Animation** is the process of creating moving, three-dimensional images using computer graphics (CG) software

**Aesthetics** is a set of principles concerned with the nature and appreciation of beauty.

**Animation** is a method of photographing successive drawings, models, or even puppets to create an illusion of movement in a sequence.

**AutoCAD** is a powerful computer-aided design (CAD) software used for creating precise 2D and 3D designs.

**Health Communication** is the process of designing, disseminating and evaluation of health messages to inform, educate and persuade audiences to adopt healthy lifestyles.

**Health Promotion** is the use of integrated effort to create awareness of diseases and issues affecting public health.

**Health Information** refers to messages that are presented to patients to inform and persuade them to comply with health care delivery.

**Health Literacy** is the ability to access health inform, consume and the ability to such information to make appropriate decisions to improve an individual's health.

**Intrinsic Load** describes the nature and degree of difficulty of subject matter that is presented through multimedia contents for learners to consume.

**Sensory Memory** refers to the use of the eyes and ears to capture information from the environment.

**UV Unwrapping** is the process of flattening a 3D model's surface onto a 2D plane, allowing for the application of textures and other visual elements

**Visual Research** is a collection of methods which use images as part of the process of generating/gathering data.

**Visual Storytelling** is using images and sequences, effectively engages audiences by evoking emotions and fostering understanding through relatable visuals.

**Working Memory** is a cognitive space for preparing and presenting information for cognitive activity.



## ABBREVIATIONS

2D	Two Dimensional
3D	Three Dimensional
ABR	Arts-Based Research
AIDA	Attention, Interest, Desire and Action
AR	Augmented Reality
CAD	Computer-Aided Design
CHPS	Community Health Planning and Services
CGI	Computer-Generated Imagery
CTML	Cognitive Theory of Multimedia Learning
DAW	Digital Audio Workstation
FK	Forward Kinematics
GHS	Ghana Health Service
HDRI	High Dynamic Range Image
IK	Inverse Kinematics
JHU/CCP	Johns Hopkins Center for Communication Programs
LTM	Long-Term Memory
MSM	Multi-Store Model
MSME	Micro, Small and Medium Enterprises
NGO	Non-Governmental Organisation
NURBS	Non-Uniform Rational B-Splines
OPD	Out-Patient Department
PSA	Public Service Announcements
SM	Sensory Memory
SMS	Short Message Service

STM	Short-Term Memory
USAID	United States Agency for International Development
UV	Ultraviolet
VR	Visual Reality
WHO	World Health Organisation
WM	Working Memory

## ABSTRACT

Malaria has been a menace of a health condition to human beings for more than seven decades. People in Africa, Asia and the America suffer the most. The aim of the study is to use animations to create awareness on the prevention of Malaria in Effutu Communities in the Central Region of Ghana. The study is qualitative and adopted Art-Based Research as the design. The AIDA Model and Cognitive Theory of Multimedia Learning underpin the theoretical frameworks for the study. Purposive and convenience sampling techniques were employed to select the participants for the study. The data collection instruments were interviews, observation and visual research (drawings and photographs). The study revealed that the use of culturally-inspired 3D animation as an aid for Malaria education is vital and efficient since it helps with easy understanding and complements what the traditional media channels (posters, flyers, TV ads and radio ads, and face-to-face) also communicate to people in the Effutu communities. The study further revealed that health officers appreciate the introduction of the use of culturally-inspired 3D animation for Malaria education because it makes it enhances understanding. The familiar environment, local name of the main protagonist and original local background sound added to igniting the interest shown in the animation by the participants. The study concludes that the inclusion of culturally-inspired 3D animation for Malaria health education adds to multiple presentations of dissemination of information and it underscores the necessity of aligning material design with both cognitive load management and cultural relevance. The study recommends that indigenous language integration should be strengthened through the development of standardized Malaria prevention terminology in Fante and other relevant indigenous languages to ensure consistency across all health education materials. The outcome of the study demonstrates the effectiveness of culturally-inspired 3D animation as an aid to preventing and controlling Malaria in Effutu Communities in the Central Region of Ghana.



## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0 Overview**

This chapter opens this research study. It entails the background to the study, describes and states the problem and the purpose for which the study was conducted. The chapter also outlines the objectives that guided the study, the scope of the study and the importance of the study to practice and society. Additionally, the chapter further looks at the delimitation and organization of the study.

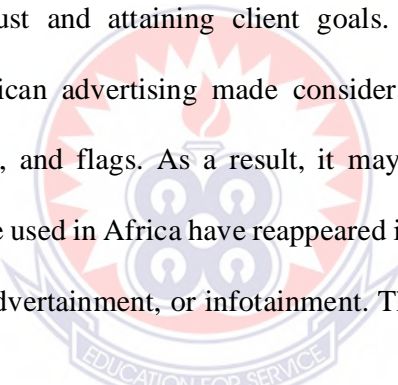
#### **1.1 Background to the Study**

Every aspect of human existence in life is meaningful with communication as the major element. Communication allows interaction among living things. This study hinges on communication to send information to specific targeted audiences.

Communication is the transfer of information through several mediums from one party to another with the sole aim of getting an understanding of the intended message being sent across. The Oxford Advanced Learner's Dictionary of Current English (2004) defines communication as the activity or process of expressing ideas and feelings or of giving people information. Information delivering is executed through either verbal or non-verbal forms of communication. The verbal form of communication is done via language and speaking and sounds. Aarti (2012) posits that speaking is an effective way of communicating. The non-verbal form of communication is done without talking. Examples are signs and symbols, music, dance, smell, movement, tone of voice, drama, painting, sculpture, graphic design, etc. These forms of communication can be classified under three major categories; they are personal or face-to-face, print media and electronic media.

In this technologically advanced era, communication encompasses more than just the dissemination of culture, values, and norms; it also serves as a channel for marketing communication, which is synonymous with promoting, informing, building relationships with customers, enhancing brand perception, and boosting customer retention. A combination of old and new media methods is employed in marketing communication to spread persuasive messages to target audiences. African-language marketing communication is essential for boosting brand awareness by concentrating on the variety of languages spoken across distinct cultures.

Advertising, direct marketing, sales promotion, personal selling, sponsorship and public relations are all tools used in marketing communication to engage with the target market via fostering trust and attaining client goals. According to Olatunji (2018), traditionally, native African advertising made considerable use of signs and symbols, including colours, logos, and flags. As a result, it may be inferred that the traditional marketing strategies once used in Africa have reappeared in the form of what is now widely hailed as edutainment, advertainment, or infotainment. The chosen language makes all of these pertinent.

The logo of the University of Education, Winneba, is a circular emblem. It features a central sun-like symbol with rays, surrounded by a wreath. Below the wreath, the motto "EDUCATION FOR SERVICE" is inscribed on a banner. The entire emblem is set against a light blue background.

Advertising uses the print media, electronic media or both in order to persuade target audiences. Types of print media used for advertising are posters, flyers, newspapers, magazines, billboard, and just to mention a few. Electronic media as a medium of communication can be utilised in several ways. Electronic media employs multiple media to come up with one electronic ad. The usual terminology used is multimedia; meaning employing two or more media to create a piece electronically to communicate such as social media posters and flyers, online banners or videos which is also called social ads, movies, infographics, animations and others.

Animation constitutes an essential electronic channel of communication. Animations are made to send information to target audiences electronically. Mayer and Moreno (2002) refer to animation as computer-generated motion pictures showing associations between drawn figures. They further state that animation is a form of pictorial presentation. Animation creates the illusion of movement when shown on any display screen. Jenkins (1898) says that it is scarce to visit a city in America without finding an advertising stand employing moving pictures in part of whole as their attraction. Advertising has been a part of the history of animation. Cook and Thompson (2019, p.1) assert that “advertising has been central to the work of famous animation studios and celebrated artists”. The success of an animation work is credited to advertising.

Studies have largely found animated videos to be effective in providing information, particularly for minority populations with low health literacy (Schnellinger et al., 2010; Calderón et al., 2007; Leiner et al., 2004). Animation is mainly perceived as non-threatening, familiar and accessible across age groups, cultures and literacy levels. It largely grasps the attention of viewers and enhances recall of activities including healthcare, online education, and socio-political and cultural activities.

Healthcare communication is a key component of rural health delivery. Creating awareness on disease prevention, control and health issues in communities in Ghana are often addressed and advertised via live-action, posters, flyers, public address system, radio and videos. Sokey and Adisah-Atta (2017, p.1) affirmed the aforementioned statement when they observed that “the most common sources of health information seeking among rural community members in the district of investigation are posters, health care providers and families/friends, with radio being the most used

platform”. A large portion of the messages for healthcare communication on posters are in the English Language, occasionally having others in the local languages. These mediums have played roles in helping to control the spread of illness and prevent illness in communities. The success gained by using any of the communication medium to share information on health-related issues is credited to the language used for that advertisement.

There are many common diseases that can be preventable. Examples of such diseases are HIV, hepatitis A, B and C, measles, Malaria, diarrhoea, blood-borne illnesses and others. Malaria happens to be one of the leading causes of morbidity and mortality among infectious diseases in the world (Zerdo et al., 2022). According to The Lancet (2020), Ghana ranks first among the top 10 causes of death while it still battles with the eradication of Malaria. Adjei (2008) reported that cases of Malaria in 2001 was 12,058, which increased to 12,338 in 2002 and 11,681 new cases were reported in 2003 all in the Amansie West District in the Ashanti Region of Ghana. The country recorded a decrease in Malaria deaths amongst persons above five years from 1,100 in 2015 to 674 in 2016 and a case fatality rate of 0.54 and 0.34 in 2015 and 2016 respectively, representing a 38.7% decrease. In 2016, Upper East and Central Regions recorded the highest above five Malaria case fatality rates of 0.80% and 0.58 respectively. Comparatively, there has been an improvement in case management in Upper East and Central Regions in 2016 to the same period in 2015 (Ghana Health Service, 2017). A study by Konlan, Amu, Konlan and Japiong (2019) further recorded that in the Volta Region of Ghana alone, Malaria topped the morbidity indicators recording 617,191 cases representing 40.96% of the total Outpatient Department (OPD) attendance (GSS, 2010). Out of that number, Ho Municipality alone recorded 70,567 cases in 2014 (Ho Municipal Health Directorate, 2016).

The currency of Malaria statistics world and in Africa is alarming. According to World Health Organisation's (WHO) 2020 report, 228 million cases were recorded worldwide in 2019. Out of the total number of cases, 409,000 people died. In the 2021 *World Malaria Report*, there were an estimated 241 million Malaria cases and 627,000 Malaria deaths worldwide in 2020. This represents about 14 million more cases in 2020 compared to 2019, and 69,000 more deaths. 95% of the number of cases and deaths are cases from Africa. The percentage of total Malaria deaths among children aged under 5 years was 67% in 2019. In 2021, Ghana recorded over 6 million presumed and confirmed Malaria cases with the estimated cases standing at over 5.3 million. An estimated deaths of 12,557 occurred in Ghana during that period (World Malaria Report (WHO), 2022).

One obstacle to eliminating Malaria is misinformation, which prevents people from using preventative measures and responding to the disease in a healthy way. (Ingabire, 2016). Intriguingly, Sokey and Adisah-Atta (2017) avow that in the rural communities in Ghana, awareness creation of many of these diseases are done in the English language which many of the folks in rural communities do not understand, thereby making diseases prevention very challenging. Many rural communities in Ghana, particularly rural dwellers of Shai Osudoku District, face numerous challenges in accessing health information, and notable among these challenges are language barriers, etc. (Sokey & Adisah-Atta, 2017). In situations where there are animations showing on screens in rural hospitals, schools, town halls etc., it would help decrease the chances of people within a community to fall victims of some diseases around them. Animations attract attention quickly so if animations are made of characters familiar to them and also the language used is that of their native one, then understanding of the messages in these animations would be easier and faster.

## 1.2 Statement of the Problem

Research on Malaria abound through several lenses. Several of them look at mortality, morbidity, intervention and causes.

Dankwah and Yamson (2019) looked at Health Information Literacy among Malaria Patients in Ghana. The study focused on Sustainable Development Goals (SDG) 3. Boateng et al. (2021) also studied the co-creation and prototyping of an intervention focusing on health literacy in management of Malaria at community-level in Ghana. These studies looked at ascertaining the knowledge of Malaria patients in determining the nature and extent of health information, and also how certain interventions can help in the management of Malaria.

A study by Agyemang-Badu et al. (2023) on the “Assessment of the Knowledge, Prevalence, and Control Strategies of Malaria among Households in Sunyani Municipality, Bono Region, Ghana” revealed that the government of Ghana needs to support Environmental Health Officers as a matter of necessity to organize public health education and Malaria campaigns in the communities via local information centres, TV, Radio, etc.

Sokey and Adisah-Atta (2017) studied the *Challenges Confronting Rural Dwellers in Accessing Health Information in Ghana: Shai Osudoku District in Perspective*. The focus of the study was to investigate health information seeking behaviour as well as the barriers to health information seeking among rural dwellers in Ghana, to be precise Shai Osudoku District. This study revealed that majority of the respondents preferred to receive health information in video formats, cell phone voice and text communication.

Significant studies have also been done in the area of animation for health education. There are some animations and live-action videos that disseminate

information on health and other interventions in Ghana. George, et al. (2013), for example, examined the use of animation as a vital mechanism to advance health research literacy particularly among minority participants in the United States. Calderón et al. (2014) have also studied how animation was used to improve Diabetes Health Literacy in the USA. The animation for the study was done in Spanish and English for the purpose of understanding. In a study by George et al. (2013), animation was used as an information tool to advance health research literacy among minority participants in Los Angeles/Hawaii, USA. The study was conducted using the English Language.

Furthermore, a campaign funded by the United States Agency for International Development (USAID) in 2009 and managed by the Johns Hopkins Center for Communication Programs (JHU/CCP) with CARE and PLAN International, the Ministry of Health and Ghana Health Service have looked at combining animation with live action in television and radio spots and posters to share health related information to the Ghanaian populace. It is called the GoodLife campaign. The overall purpose of GoodLife is to support the GHS (and partners) at the national, regional and district levels to achieve health-related Sustainable Development Goals through evidence-based and theory informed social and behavior change communication (SBCC) interventions. The campaign targets everyone to know that healthier, happier living is possible for all and together we can help to improve the health of all Ghanaians. This innovative campaign stresses the importance of feeding children the right balance of foods, in addition to breast milk, starting from six (6) months of age. The campaign is broadcast nationally and features community mobilization efforts in Greater Accra, and the Central and Western Regions of Ghana, according to USAID and Ghana Health Service in 2009.

So far, videos circulating from GoodLife campaign reveal a combination of live action and animation, and live action only. Also, the language used in one of the main videos (animation and live action) which lasted for four (4) minutes and eleven (11) seconds was Multi-lingual (English, Ga, Ewe, Hausa, Twi) all in one video. Some of the other videos are also in Twi and English languages only without considering other local spoken languages in Ghana such as Akan, Effutu, Fanti and to mention a few

Mills Media is a Ghanaian media outlet that specializes in using animation, comics and games to tell and project African Stories to the rest of the world. Mills Media premiered its latest animation film in 2022 titled *Heroes of the Past: Asantewaa, Battle for the Golden Stool*. In this movie, the languages used were English as the dominant one and few expressions of the Akan Language (Twi) were also employed.

With respect to the use of language in advertising, Nwachukwu (2005) explains that languages are rich in illustrations and explanations. The role of language in advertisement has also been studied by Widyahening et al. in 2015. Widyahening et al. (2015) study reveals that language is an important aspect of any form of advertisement. Though some scholars (Nelson, Proshina, & Davis, 2020) have postulated that using native languages along with English lends credibility to certain commercials, other scholars like Heo, Jogaratnam and Buchanan (2004), and Holmqvist (2011) have also argued that using indigenous languages is more effective at getting the intended audience to act on what is communicated because it takes less time and cognitive effort to understand.

Despite these relevant extant studies above, significant lacuna still exists in relation to animations produced in other local languages (eg. Fante, Effutu, Dagbani etc). Minimal or no known studies have looked at using only animation with the spoken local language of the people to increase awareness of diseases prevention in

communities in the Central Region of Ghana. This situation is worrying considering that the majority of the Ghanaian population who live in the rural areas, such as the Effutu Municipality of the Central Region, do not have adequate command over the English Language, therefore, the need for the present study which only focuses on producing culturally-inspired 3D animation with fante language as the voice over.

### **1.3 Purpose of the Study**

The purpose of this study is to produce a culturally-inspired 3D animation in Fanti Language orientation to enhance awareness creation of Malaria prevention in Effutu Communities in the Central Region of Ghana. The animation having its voice-over in the Fanti Language of the indigenous people is very important to help with easy understanding of the message in the animation. The study further looks at examining how the community dwellers and health officers interpret the communication and persuasive elements used to develop the animation and their perspectives.

### **1.4 Objectives of the Study**

The following objectives guided this study. To:

1. identify and analyse the modes and channels used to communicate the preventive measures of Malaria in the two (2) selected health centres within Effutu Communities.
2. produce a culturally-inspired 3D animation in Fanti language to enhance the prevention of Malaria in the two (2) selected health centres in the Effutu communities.

3. examine how the community dwellers interpret the communication and persuasive elements used in the developed Malaria Education Animation for the Effutu Communities.
4. examine the health officers' perspectives about the developed Malaria Education Animation for the Effutu Communities.

### **1.5 Justification of the Objectives**

The objective is necessary to help the researcher embark on this project successfully.

*Objective One:* There is the need to know how the community dwellers receive information on the preventive measures and the spread of Malaria in Effutu Communities in the Central Region of Ghana. This will aid in the execution of the study.

*Objective Two:* This objective is necessary because that is the core of the study. This is where all elements will be brought together to create storyboards, characters and scenes for the development of the various animations. The voice recording will provide complete meaning to the message the study is sending and make it easy for the community to understand the animation.

*Objective Three:* The community dwellers have a say in the receipt of Malaria information from the health officers or from any media available. This is important because the target of the animation are the community dwellers and it is important to know if the content of the animation serves its intended purpose and meet the needs of the consumers of the animation.

*Objective Four:* This objective will help researchers and the publics to know the views and experiences of the health officers after watching the finished animation and also using it for Malaria education.

## **1.6 Research Questions**

The following research questions guided this study

1. What are the modes and channels used to communicate the preventive measures of Malaria, and the dominant visual communication materials available for communication during Malaria education in the selected health centres within Effutu Communities?
2. What elements can be used in the production of a culturally-inspired 3D animation in Fanti language to enhance the prevention of Malaria in Effutu Communities?
3. How do community dwellers interpret the communication and persuasive elements used in the developed Malaria Education Animation for the Effutu Communities?
4. What are the health officers' perspectives about the developed Malaria Education Animation for the Effutu Communities?

## **1.7 Delimitation**

This study is delimited to communities in Effutu in the Central Region of Ghana. Also, the study focuses on the use of animation with voice-over recordings in the local language of the people (Fanti Language). The study is further delimited to two (2) health centres in Winneba, namely Winneba Municipal Hospital and Trauma

Specialist Hospital. Moreover, the study is further delimited to the Malaria-related animation developed by the researcher.

### **1.8 Significance of the Study**

The Government of Ghana through Ministry of Health, World Health Organisation (WHO) and other Non-Governmental Organisations (NGOs) keep putting in measures to help prevent the spread of the diseases in Ghana. Efforts by the Ministry of Health and others mentioned above are encouraging and commendable with regards to advertisement and awareness creation on health issues, but there seems to be either an increase in some of these diseases yearly.

The increase in health-related issues may be as a result of how information is being communicated to people in communities. If people can understand the way information is given them, then it will reduce the burden on government or NGOs, because, if one can explain health-related issues to people in the language they can understand, it will be easier for them to follow the rules and protocols concerning the said health-related issue.

This study seeks to demonstrate the effectiveness of animation as an aid to preventing and controlling diseases in rural communities in Ghana. Animation is not new, but the study would want to try it in this research. The voice over alone for the animation is not enough but when it goes with characters that are familiar with the people it increases interest of the viewers and thereby understanding information becomes easy. It contends that when it comes to rural health delivery, animation meant for advertising preventive and control measures of diseases is more effective than printed posters. When the people understand and are able to connect to the animations,

this would help to reduce cases of many diseases in the rural areas, and then it would also further decrease the stress on the hospitals, its personnel and patience.

Creating and advertising interactive animations to increase the awareness of diseases prevention in rural communities in Ghana is crucial. As such, the study seeks to develop innovative ways of uploading the animations onto modern technological gadgets like external drives and show them on screens at hospitals and other public places in the communities in Effutu in the Central Region of Ghana with the consent of the University of Education, Winneba. The study is a novel attempt at reaching people in the rural communities in Ghana in order to help take care of their health needs from Malaria. The study will contribute significantly to the ongoing search for ways of achieving Goal Three (3) of the United Nations Sustainable Development Goals which talks about good health and well-being, a major challenge to Ghana and most parts of Africa and elsewhere.

This research like other research works will add to knowledge and literature. It will be used as a reference document for future researchers who may want to do extensive studies in the field of this study.

## **1.9 Facilities Available for the Research**

The following facilities and resources are available

1. University of Education, Winneba Library, Winneba, Central Region, Ghana
2. The Holy Church of God Multimedia Lab, Accra, Greater Accra, Ghana
3. Pixil Motion Studios Lab, Accra, Greater Accra, Ghana
4. Gazy Media Studios, Accra, Greater Accra, Ghana
5. Mills Media Studios, Accra, Greater Accra, Ghana

### **1.10 Organisation of the Study**

The study is organized into six chapters. Chapter One provides the background to the study, statement of the problem, research objectives, justification of the objectives, research questions, significance of the study, delimitation and facilities available for the study.

Chapter Two takes care of review of related literature, research paradigm, theoretical framework underpinning the study, conceptual framework developed from the theories, and review of current and related studies. Chapter Three looks at the methodology employed for the study. It started with the research approach and research design used for the study. It followed on to justify the approach and design used. The chapter goes on to select the data collection technique, sample size, data collection procedure, method of data analysis and the ethical considerations employed for the study.

Chapter Four presents the studio research, production processes and techniques employed in the production of the animation. Chapter Five focuses on the presentation of findings and discussions concerning the objectives and the reviewed literature for the study.

Chapter Six concludes the study by discussing the summary, conclusions, and recommendations for this study. Finally, the references for this study were organized and arranged in alphabetical order in APA referencing (7th edition) format followed by appendices.

## CHAPTER TWO

### REVIEW OF RELATED LITERATURE

#### 2.0 Overview

This chapter deliberates the literature that underpins the study. The review looks at the theories that ground the study and empirical literature related to the topics. The theoretical foundations largely make every academic work quality. The empirical literature focuses on advertising and animation, influence of animation, types of animation, animation production practices, animation production, the use and production of animation for health education, communication, language and culture.

#### 2.1 Theoretical Framework

Theoretical framework is the blueprint for an entire dissertation inquiry. It serves as the guide on which to build and support a study, and also provides the structure to define how the researcher will philosophically, epistemologically, methodologically, and analytically approach the dissertation as a whole (Grant & Osanloo, 2014). The model supporting this study is the AIDA Model and Cognitive Theory of Multimedia Learning (CTML). This section discusses the AIDA Model and then continues with Cognitive Theory of Multimedia Learning (CTML) for this study.

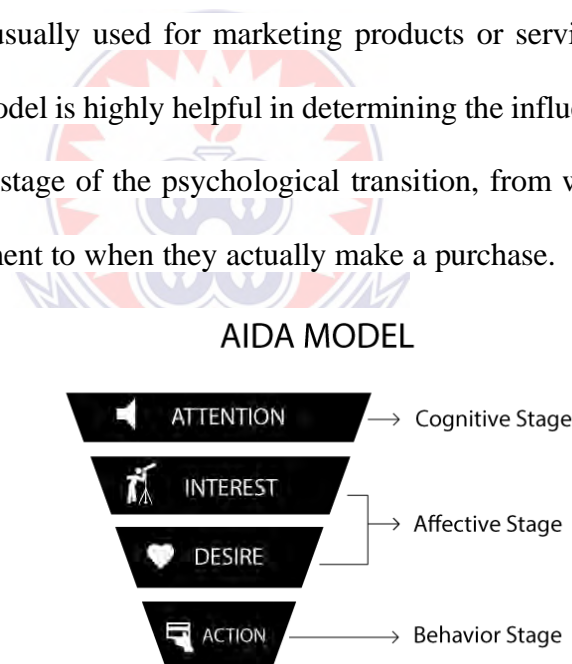
#### 2.2 AIDA Model

The development of the AIDA model is traced back to one American advertising advocate and businessman named: St. Elmo Lewis. In 1898, he proposed this advertising model called AIDA model. Elmo Lewis framed the three-part formula namely attract attention, maintain interest and create desire. Later, Lewis added a new phase called get action. Some books give credit to Edward K. Strong, Jr. as the proposer of the theory under discussion, but in 1925, Strong ended this misconception by setting

the records straight by attributing the authorship of the AIDA model to St. Elmo Lewis in a book he published which was *The Psychology of Selling and Advertising*. Strong in (1925) developed the model from its initial form, which became known in advertising literature as AIDA.

According to St. Elmo Lewis, the purpose of an advertising is to draw the reader in so that he/she will take notice of it and begin to read it; then, to pique his/her interest so that he/she will keep reading; and last, to persuade him/her so that after reading it, he/she will believe it, after believing in the advertisement, the reader must take an action which is to follow or practice the intended purpose of the advert. An advertising is successful if it possesses these three characteristics of success, and finally action.

The model is usually used for marketing products or services. Kojima et al. (2010) posit that the model is highly helpful in determining the influence of advertising since it manages each stage of the psychological transition, from when an individual first sees an advertisement to when they actually make a purchase.



*Figure 1: AIDA Model*

*Source: <https://www.businessstopia.net/communication/aida-model>*

AIDA is an acronym which means A – Attention/Awareness, I – Interest, D – Desire and A – Action.

Ghirvu (2013) did a study on Advergimes using the AIDA Model. Ghirvu defines Advergimes as a type of online video game built around a specific brand or product with the primary goal of promoting it. Ghirvu's paper interprets the AIDA Model in the context of online advertising games to describe the consumer's purchase process. The stages of the process are explained using the interaction established between a consumer and a brand during a game session in which the player is exposed to advertising messages embedded in advergame content.

A very recent study by Purbaningsih et al. (2022) looked at understanding the AIDA Model in Marketing Small Business in the Digital Age: Opportunities and Challenges. The study utilised the AIDA Model to come up with its findings. Based on the results of the study and discussion, it concluded that the understanding and application of the AIDA marketing model for marketing Micro, Small, and Medium Enterprises (MSME) products and services in the digital era is very profitable. Based on Purbaningsih et al.'s findings above, this study benefited very well in using the AIDA Model in the execution of the animation. The AIDA Model greatly impact this current study by guiding the formation of the 3D animation from the idea development, scripting writing, storyboarding through to the final rendering and compositing.

Below discusses the tenets of AIDA Model.

### **2.2.1 Attention**

An advertiser must first and foremost have the idea of attracting the target group's attention. The first phase of the AIDA model is to initiate the activation, perception, and emotional process. According to Ghirvu (2013), an advertiser must promote a product in such a way that the customer is made aware of the existence of that specific service. The purchasing process begins when a consumer is unfamiliar with a particular brand and must first learn about the existence of the product or service.

This first step in the cognitive hierarchy is concerned with capturing and retaining the consumer's attention. Lowe and Schnotz (2014) make a good point with regards to attention-grabbing. According to Lowe and Schnotz (2014), by incorporating dynamic highlighting techniques, animations can aid in capturing learner's attention. Vakratsas and Ambler (1999) say that one unique way to capture a people's attention is through the use of attention-grabbing headlines or visuals.

This study considered the principles guiding attracting attention to create the animations to appeal to the emotions of the rural dwellers and also use the same to create the awareness. In this regard, the layout, elements for designing and other vital elements such as visuals and others were considered while planning on the development of the animations.

### **2.2.2 Interest**

At this stage, the main objective is to get the people interested and sustain their interest. Dahlen, Lange and Smith (2010) aver that interest can be achieved by providing information about a product's features, benefits, and unique selling propositions (USPs). Belch and Belch (2018) also support the preceding idea that emotional appeals can be used to generate interest by tapping into a target audience's values and beliefs.

There are elements like background text, isolated images, or text with instructions that can help people become interested in a product. Cut-scenes are common in videogames and can be analyzed separately using general game elements and patterns of audio-visual structures previously studied by scholars (Joost et al, 2008). In this phase of the decision-making process, elements should be tailored and presented in a better format. This allows the researcher to understand what interest the rural

dwellers, what is important to them, what needs they have, and what problems they want to have solved.

### **2.2.3 Desire**

At this stage of the AIDA model, the makeup of the animation will have to heighten the rural dwellers general interest to develop it into a concrete action intent which is the desire to fall in love with the animation. Ghirvu (2013) says that Advergimes and other multimedia artworks can increase desire by incorporating visual, audio, and textual elements. Elements from other media, such as television and movies, can be used in Advergimes (Joost et al. 2008). Elements of animation and video games, such as character design, interface design, texturing or the design of other multimedia elements, can contribute to increased desire. Audiovisual, visual, and textual layers may all play different roles in the creation of animations, depending on the creators' intentions. Desire is achieved when some or all the elements discussed above are considered in the creation of an animation or any multimedia art piece.

### **2.2.4 Action**

At this stage of the model, advertisers should have succeeded in creating animations meant for the rural dwellers. This should motivate the dwellers to take an action, in this case, they should have a mindset of wanting to develop a better behaviour towards the implementation of the messages in the animation. The implementation, here, becomes the actions taken by dwellers to practice the protocols outlined in the animations.

Per the studies reviewed, the AIDA model appears to have been used for several marketing related research studies. This study employed the tenets of this model to help

in the creation of the storyline for the animation, which is meant to help create awareness to reduce the spread of Malaria in the rural communities in Effutu (Winneba). The storyline for the animation is seen in a storyboard. The tenets and the purposes of the AIDA model were carefully considered in the formation of the details of the storyboard which include the nature of the environment and the characters, and the messages. The makeup of the storyboard is meant to help attract the attention of the rural community dwellers to make them have an interest and desire in the animation, that is intended to motivate and provoke them to want to practice the preventive measures that help reduce the spread of Malaria in the community. The complete inculcation and considerations of the tenets of the model is generally meant to make the rural community dwellers to finally make an informed decision to adhere to the consciously or unconsciously follow the measures outline in the animation. This study adopted the principles underpinning the AIDA Model for a successful outcome of this study.

### **2.3 Cognitive Theory of Multimedia Learning (CTML)**

The proponent of the cognitive theory of multimedia learning is Richard Emanuel Mayer. Mayer is an American Educational Psychologist and Professor of Psychology. The theory was developed in 2001 to explain how multimedia learning works and how one can best utilise it.

Multimedia learning is the kind that supports learning with pictures and words. With this kind of learning, it is evident that people learn deeply when pictures and words are used simultaneously than words alone. Mayer (2014) defines multimedia learning as the form of learning from words and pictures. Examples of some of these multimedia works are interactive lessons, online presentations, e-courses, simulation games,

slideshows and even textbooks play a crucial role in education (Mayer, 2014). With these multimedia pieces, people are able to build mental representations from the pictures and words. When Mayer says pictures, he means the use of illustrations, graphs, charts, diagrams, photos, animation, videos and other visual representations. And words are either the use of spoken or printed text.

Mayer has devoted about two decades exploring and upgrading this theory. The theory looks at how people learn from words and pictures. Mayer (2005) postulates that the theory is grounded on three cognitive science principles of learning. They are dual-channels assumption, limited-channels assumption and active-processing assumption. Dual-channels assumption looks at how human's possess separate channels for processing verbal/auditory and visual/pictorial materials; Limited-channel states that each channel can process only a small amount of material a time, and active-processing assumption says that meaningful learning involves engaging in appropriate cognitive processing during learning.

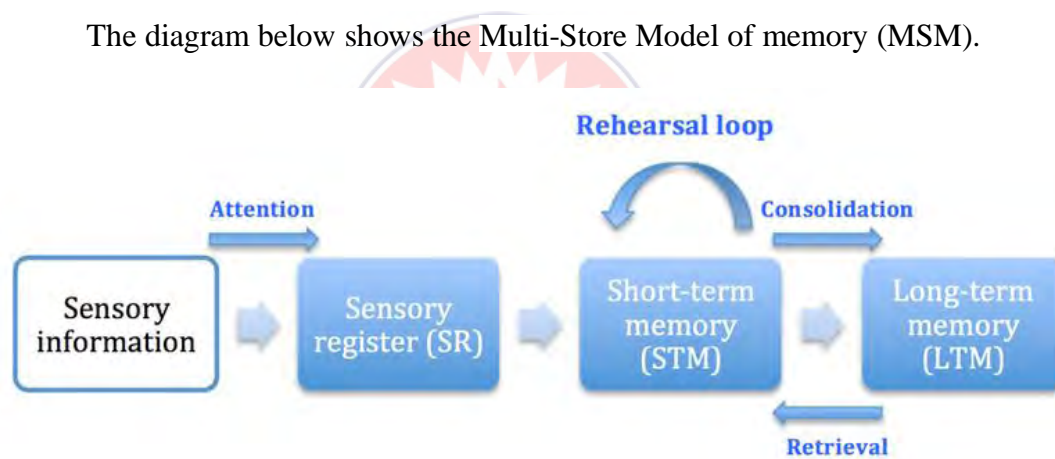
Multimedia learning is all about using visuals, spoken words and sound electronically to foster learning. Visuals used for electronic learning come in two forms, either text (typography) and/or images. The visual images used in multimedia learning can be vector graphics, bitmap graphics, still photographs and live action, paintings, diagrams, graphs, bar charts, cartoons and caricatures, etc.

With the theories main stem being words/verbal and pictures/visual, Mayer and Moreno (1996) stipulate that people learn better when both channels are engaged in productive cognitive activities that make room for mental representation of visuals, organisation of information, comparison to previous knowledge and understanding. A learner can employ both information processing channels simultaneously when unique information is presented in both visual/pictorial and auditory/verbal formats, and they

can create integrated mental models that increase the likelihood that the information will be remembered (Paivio, 1986; Plass, Chun, Mayer & Leutner, 1998). It appears that the two channels have limitations to how the nature of information can be received and processed at a given time. But if an individual uses both channels appropriately, it can facilitate the learning process and help with understanding.

For the purposes of improvement and understanding, the theory draws from Atkinson and Shiffrin's (1968) three distinct memory systems model for processing text, pictures/images and sound. According to Atkinson and Shiffrin, as quoted by Mayer (2014), sensory registers, working memory, and long-term memory operate differently under peculiar limitations when processing visual and audio signals.

The diagram below shows the Multi-Store Model of memory (MSM).



*Figure 2: Memory transfer between the SR, STM and LTM*

*by Atkinson and Shiffrin's Multi-Store Model.*

Atkinson and Shiffrin's (1968) Multi-Store Model of memory (MSM) describes the flow between three permanent storage systems of memory: the sensory register (SR), short-term memory (STM) and long-term memory (LTM). Information from the senses is stored in the SR, but it is only retained there for about half a second before

being lost. It is modality-specific, meaning that whatever sense is registered will correspond to how it is held as a result.

Nevertheless, if paid attention to, sensory data enters the STM for short-term storage and is encoded visually (as an image), acoustically (as a sound), or, less frequently, semantically (through its meaning). STM is believed to have a 5–9 item capacity and last for about 30 seconds. This capacity can be raised by "chunking," which is the process of breaking up a long list of items into several smaller ones, for example, changing the number 021234567 to 021 234 567.

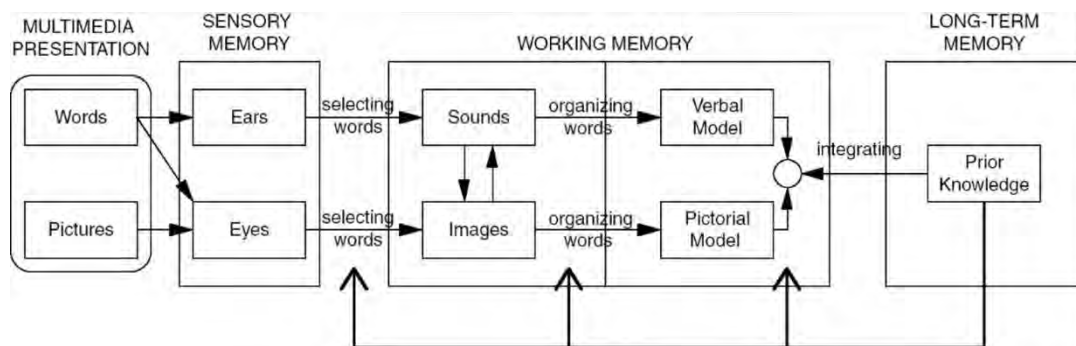
Knowing the tenets of the Atkinson and Shiffrin's model, this study considered the rate at which the human memory receives and recognizes information in the creating of the story for the animation.

Mayer further developed a framework using the Cognitive Theory of Multimedia Learning and John Sweller's (1998) Cognitive Load Theory to help people to understand information when disseminated. The working memory and long-term memory are seen by Cognitive Load Theory as constituting the human cognitive architecture, which builds on the work of Baddeley and Hitch (1974).

Cognitive load theory is founded on several numbers of generally accepted theories about how human brains process and store information (Gerjets, Scheiter & Cierniak, 2009). These presumptions include the notions that working memory and long-term memory exist in humans, that knowledge is stored in the latter as schemas, and that processing new information places a "cognitive burden" on the working memory that may have an impact on learning outcomes (Anderson 1977; Atkinson & Shiffrin 1968; Baddeley 1983).

The working memory is the memory system where small quantities of information are kept for a relatively brief period of time (Peterson & Peterson, 1959).

Simply said, the working memory has a certain amount of space and is made up of a variety of parts that control attention and coordinate cognitive functions. What we are consciously aware of at any given time is essentially equivalent to working memory. Clark, Kirschner and Sweller (2012, p. 8) call it the limited mental “space” in which we think. In contrast, long-term memory has an infinite capacity for storing and collaborates with working memory to retrieve information (Baddeley, 2003). The long-term memory is the memory system where large amounts of information are stored semi-permanently (Atkinson & Shiffrin, 1968; Tulving, 1972). It is referred to as the big mental faculty of things we know (Clark, Kirschner and Sweller, 2012).



*Figure 3: The Three Sub Memory Systems and Cognitive Theory of Multimedia Learning (Mayer, 2014)*

The framework above helps explain the cognitive processing during learning from educational multimedia videos. The core issue in the framework is how to help people learn. This framework of learning gets the hearing and seeing senses to be active and understand an activity. The framework states that working memory (WM), long-term memory, and the sensory memory (SM) are the three cognitive components of the cognitive system through which learners acquire knowledge (LTM).

Brame (2006) says that the sensory memory refers to the use of the eyes and ears to capture information from the environment. With the makeup of the framework, information is first received by the sensory memory which is the ear and the eye, and

stored in the store, which temporarily stores raw, unprocessed information until the stimulus pattern is recognized. If information is captured in the sensory memory (SM), it is then sent to the working memory (WM) for processing and storage. According to Mekheimer (2024), the working memory is a cognitive space for preparing and presenting information for cognitive activity. In order to prepare and organize information for cognitive activity, the working memory should serve as a cognitive space. Klatzky (1975) also argues that in the working memory, information can be practiced, elaborated, used for decision-making, lost, or retained in the third memory structure. Due to the functions outlined by Klatzky, the working memory can also be equated with consciousness (Sweller, Van Merriënboer, & Paas, 1998). An individual must be conscious to assimilate and comprehend information. The inference of how the human brain processes and stores information to this study is that the information in the animation must be delivered in a manner that fosters easy accommodation of the information by the human brain.

The Atkinson and Shiffrin's (1968) Multi-Store Model of memory, Three Sub Memory System and the Cognitive Load Theory lay emphasis on the fact that the human brain is able to record pictures (images), words (text) and sound via the senses of the ear and eyes. The eyes senses perceiving the text and images used in the animation, whereas the ears hearing the sound of the background sound and the voice-overs which is the verbal information used in the animation.

The Cognitive Load Theory has three categories included in it. There are the intrinsic, extraneous and germane. The gathering, storing, and utilization of physiologically supplementary information fall under the purview of all cognitive load categories.

Sweller et al. (2019) argues that the intrinsic load describes the nature and degree of difficulty of subject matter that is presented through multimedia contents for learners to consume. It is determined by levels of element interactivity (Sweller et al., 2019). Two factors influence intrinsic cognitive load. They are the complexity of the material, and the prior knowledge of the learner (Leppink & van den Heuvel, 2015; Sweller et al., 2019). This implies that a subject matter which is tough for a beginner is possible to be very easy for a professional.

With regard to this study, the message in the animation should be easy to understand by the rural dwellers. The implication of intrinsic load to this study is that designers must simplify the content of a message in any art piece which is meant for education to foster easy assimilation. The message of information must be delivered to learners in what is termed the 'simple-to-complex' approach. van Merriënboer, Kirschner and Kester (2003) posit that when elements of a material or an activity are introduced to learners in a simple-to-complex order, initial exposure to the content does not fully expose learners to its complexity.

Many theorists concur that instructional strategies that simplify difficult content can change intrinsic cognitive load. The "simple-to-complex" strategy, in which the elements of the content are delivered to the learner in a simple-to-complex order so that the learner does not initially encounter the entire complexity of the subject, is one method for reducing the intrinsic cognitive load of the material (van Merriënboer, Kirschner & Kester 2003). A second technique is known as the "part-whole" strategy, in which the learner is initially taught to each component of the information before being given the entire job (Bannert 2002; Pollock, Chandler & Sweller 2002). A third strategy is to start by presenting the subject in all of its complexity before drawing the learner's focus to the various interdependent components (van Merriënboer, Kester &

Paas 2006). According to Van Merriënboer and Sweller (2005), both simple-to-complex and part-whole techniques help learners by starting with a single, simple element and progressively adding complexity.

Extraneous cognitive load deals with how a particular subject matter is taught. According to van Merriënboer and Sweller, 'extraneous cognitive load is not necessary for learning and that it can be altered by instructional interventions' (2005, p. 150). Sweller (2010) supports the preceding statement by noting that high levels of element interactivity are what lead to the extraneous cognitive load, but in this situation, the element interactivity is brought on by poor instructional designs that unnecessarily raise the quantity of interacting elements that learners must process at a time for foster learning. Simply put, extraneous load is not a good type of cognitive load, because it does not contribute to learning directly. Some cognitive load theorists suggest that instructional designs are most effective when it reduces extraneous load in order to free up the capacity of working memory. In this vein, the animation considered the use of necessary elements in its makeup. The unnecessary elements that make up extraneous load were avoided to enable the working memory of the rural dwellers to grasp the intended message of the animation.

The last cognitive load which is germane, is said to be very effective. Paas and Sweller (2014) posit that the working memory resources that are devoted to dealing with intrinsic cognitive load rather than extraneous cognitive load is referred to as interlectual activity. The intellectual activity is necessary to correctly decode the meaning of a form of mediated communication. Germane load is the active construction, learning new knowledge and permanent storage owing to learners' efforts and availability of cognitive capacity, according to Homer et al. (2008) and Ibrahim (2011). Similar to this, Mayer (2014) emphasized that the most desired cognitive

outcome is germane load since it reflects the reserved mental capacity that controls the subtleties of memory intrinsic cognitive to enable efficient learning.

Based on the preceding discussion, the Cognitive Theory of Multimedia Learning gives clues on how designers should plan multimedia creation or pieces, and how to use successful cognitive techniques to speed up learning (Sorden, 2012). In the context of this study, the researcher employed the required tenets of the theory to inculcate the necessary elements that helped to get the community dwellers interested in the animation and its message.

As part of the factors that facilitated the production of the animation via Richard Mayer's Cognitive Theory of Multimedia Learning, some basic and advanced principles of multimedia learning were outlined to shape the design and organization of any multimedia presentations were put into proper consideration. These principles are cited in Mayer's (2014): *The Cambridge Handbook of Multimedia Learning*. The principles are as follows;

1. *Multimedia Principle*: This principle suggests that people learn better from words and pictures than from words alone (Butcher, 2014). Mayer (2001) also supports the multimedia principle by connoting that learning is very effective when people learn with words and pictures rather than words alone. He further states that the principle generally adds that there is a positive impact of visual and verbal information on learning outcomes.
2. *Split-attention principle*: Ayres and Sweller (2014) connote that when words and images are physically and chronologically interwoven, individuals learn more effectively. This principle is similar to Mayer's spatial contiguity and temporal contiguity principles. Spatial contiguity says that when corresponding text and images are placed close together on a page or screen rather than far

apart, people learn more effectively, whereas temporal contiguity principle suggests that people learn more effectively when related words and images are shown at the same time rather than one after the other (Mayer & Fiorella, 2014).

3. *Signalling Principle*: People learn more effectively, when cues that emphasize the arrangement of the crucial information are introduced (Mayer & Fiorella, 2014).
4. *Personalisation, voice, embodiment, and image principles*: According to this principle, people learn better when a multimedia presentation uses conversational language rather than formal language, when a regular human voice is used instead of a machine voice or a voice with a foreign accent, and when on-screen characters use humanlike gestures and movements; however, this is not always true when the speaker's image is displayed on the screen (Mayer, 2014).
5. *Guided discovery principle*: With this principle, de Jong and Lazonder (2014) argue that people learn better when guidance is incorporated into discovery-based multimedia environments.
6. *Worked examples principle*: Renkl (2014) avers that in the first stages of skill learning, people learn better when they are given practical examples.
7. *Multiple representation principle*: Ainsworth (2014) argues that there are situations where many representations help people learn more effectively.
8. *Animation principle*: People do not always learn more effectively through animation than they do from static diagrams (Lowe & Schnotz, 2014). This assertion by Lowe and Schnotz (2014) is contrary to other researchers' views on animation and the power it carries. Some people think that since animations are so highly compelling, they can aid in learning (Rieber, 1991). Alternatively,

others assert that animations have unique computational characteristics that are compatible with the cognitive requirements of a learning task (Tversky et al., 2002). Lowe and Schnotz (2014) further clarify their earlier statement by stating some functions of animation. In this function, a principle state that when the animation's educational goal has been made obvious and well defined, people learn more from it.

Based on the principles discussed above and having in mind the cognitive theory of multimedia learning and its implications on the study, rural dwellers would learn better from the animation. The principles say that users of animation learn better;

- a. when the text, images, and sound are appropriately emphasized and well employed in the creation of the animation,
- b. when perpetual attributes and cognitive requirements are carefully matched,
- c. when cognitive processing and perceptual processing are properly supported, and
- d. when interaction opportunities match the objectives and the learner's level of expertise, among other things.

#### **2.4 Conceptual Framework that supports the Study and its Implications**

Conceptual frameworks are usually developed based on literature and theoretical review of existing studies about the topic being studied. The framework for this study was derived from the AIDA Model, the Cognitive Theory of Multimedia Learning discussed above and the production procedures for creative artworks. Together, they give a visual picture of the built-in academic engine, which the researcher believes can help the study move forward and accomplish its major goals.

The framework demonstrates the connections between every idea that is important for the creation of an educative animation, which will assist raise awareness of disease prevention in rural areas and slow the spread of this disease.

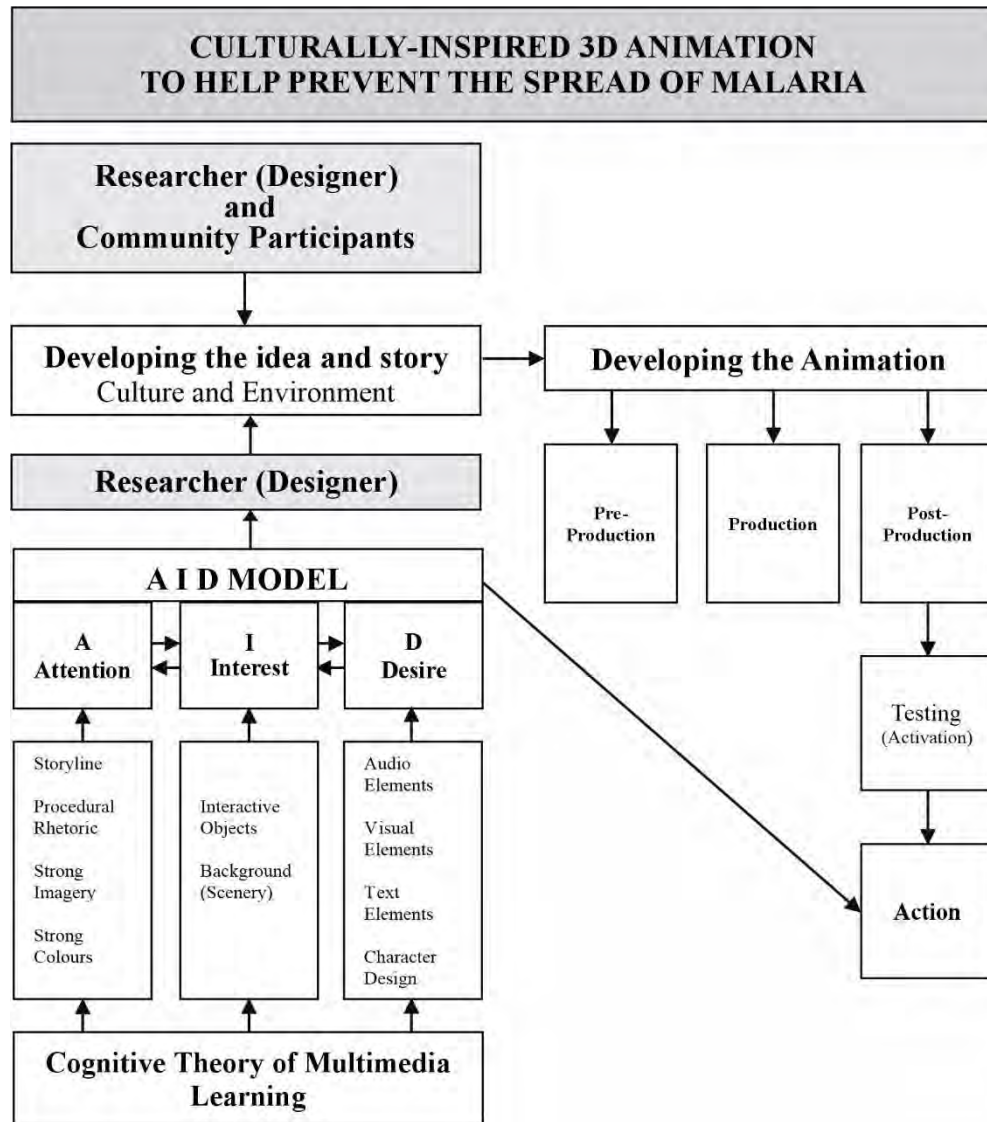


Figure 4: Conceptual Framework for the Study. Source: Researcher's construct, 2024

This study holds that successful usage of animation goes beyond merely disseminating information in order to increase awareness of disease prevention and reduction. The cognitive theory of multimedia learning's foundational elements of audiovisual communication can be organized and manipulated to influence an

audience's perceptions, in this case, the perception of rural residents. These audio and visual elements are what were carefully considered in the production of the animation.

The core of the framework is the topmost level, as depicted in figure 4. Since the top level is the core phenomenon that the study aimed to understand, it is the dependent variable for this study. The creation of the animation that is helpful, educational, entertaining, and culturally driven depends on a number of important variables. On the other levels of the framework, these factors have been depicted.

The second level of the diagram labelled Figure 4 has two components; namely developing the idea and story, and developing the animation. The involvement of the researcher and the community participants is very crucial at this phase of the model to get their inputs for the development of the animation. In the development of the idea and story for the animation, the AIDA Model was employed to incorporate and properly utilise the key elements of the cognitive theory of multimedia learning to develop the idea and the story for the animation. The first three core tenets of the AIDA Model which are; attention, interest and desire were well looked at through the lenses of storyline, procedural rhetoric, strong imagery, and strong colour for gaining attention; interactive objects and background or scenery for arousing interest; and audio elements, visual elements, text elements and character design for achieving desire, to develop the story and idea of the animation.

On the other component of the second level which is developing the animation, pre-production, production and post-production were done to realise the actual development of production of the animation. Post-production in animation development talks about finalizing the actual artwork (animation).

Afterward, testing of the finished animation yields, action, which is the last piece of the AIDA Model. Action also means activation which is making the animation

available to the rural dwellers. Action in this context gets the rural dwellers to make a decision to practice the preventive measures outlined in the animation.

## **2.5 Empirical Reviews**

### **2.5.1 Art-based research reviews**

Art-based research has gained its recognition as one of the latest research designs used in qualitative research studies. McNiff (2018) defines Arts-Based research as the systematic use of the artistic process, the actual making of artistic expressions in all of the different forms of the arts, as a primary way of understanding and examining experience by both researchers and the people that they involve in their studies.

Boydell et al. (2012) reviewed literature on the use of ABR methods in health research. The study actually looked at the production and dissemination of knowledge. The purpose of the study was to determine the scope of the peer-reviewed literature, compile findings, and pinpoint gaps. A search of a literature database turned up 71 original research works. Diverse designs and artistic styles, as well as important health themes, were characteristics of the studies.

In qualitative research, the arts were seen as a means of creating data that went beyond the reach of most interview-based methodologies, a way to improve communication and make research accessible to audiences as well as participants, and an opportunity to increase participant and audience participation. Three main gaps were found to exist: the need for a critical discussion on the effects of Arts-Based health research, the necessity of concentrating on the standards used to evaluate the caliber of these initiatives, and the necessity of addressing the moral dilemmas associated with doing this kind of work. According to the study, expanding qualitative methodology to incorporate Arts-Based approaches gives distinct ways of knowing rather than just

serving as an afterthought to conventional methods of gathering and disseminating data. The study concluded that, there may be a turning point in the field where we need to consider whether or not we are seeing a paradigm shift in the way we approach social science research and/or the emergence of a novel set of methods that researchers can use to improve on established approaches to qualitative inquiry.

Van der Vaart et al. (2018) also looked at using Creative and Arts-Based Research Methods in Academic Research. The study zoomed into the lessons from a Participatory Research Project in the Netherlands. The paper adds to the conversation on how valuable creative and Arts-Based research methodologies are for scholars who study community resilience. Drawing on a participatory research study carried out in a Dutch community using a combination of these techniques, the authors provided more detailed, practical explanations of their worth. The study elaborated on the three project stages: walking interviews, group discussions, and a creative workshop that resulted in an exhibition, and on the challenges encountered during our project. It further explained how every project phase aided in the creation of diverse knowledge. The authors claim that discussions regarding the nature and consequences of creative and Arts-Based methods, as well as the dearth of methodological reflection on these approaches can be helpful to researchers. Based on the study, the authors concluded that, in spite of certain difficulties, researchers interested in community resilience can benefit greatly from creative and Arts-Based research methods. The study found researchers can produce profound insight by going beyond logical cognitive methods of knowing and offering fresh perspectives on people's actual lived experiences and points of view. Researchers can also provide opportunities for community members to "give back" and support one another, which may inspire them to take further action and strengthen the bonds that bind their community.

This study adopted some key research elements employed by Boydell et al. (2012) and Van der Vaart et al. (2018) in their respective studies. This study specifically adopted the qualitative research approach and Arts-Based Research as the design for the conduct of the study as suggested by the above authors. The study went further to use interviews and field observation to develop the ideas, concepts and storyboard for the creation of the animation.

### **2.5.2 Visual Communication**

Visual communication, a pivotal field in conveying messages through images, symbols, and other visual elements, plays an influential role in shaping perceptions, enhancing understanding, and engaging audiences across various mediums (Forceville, 2023). The effectiveness of visual communication lies in its ability to transcend language barriers, making it particularly valuable in public health campaigns where reaching diverse populations is essential (Stephens, 2019). In this regard, visual elements are designed to be universally understood, conveying complex messages in an accessible and engaging way.

Research indicates that well-crafted visual messages can greatly enhance comprehension and information retention, especially when communicating intricate or technical subjects (Ware, 2019). Visual communication's capacity to simplify complex information through visual storytelling, graphics, and illustrations has been shown to aid in clearer understanding, making it highly effective in health education contexts, such as Malaria awareness campaigns (Lazard & Schreiner, 2018). By combining elements such as colour, motion, and typography, visual communicators can evoke emotions, build narrative, and foster a deeper connection with the intended audience (Wang & Mo, 2021).

Recent advancements in technology, including 3D animation, virtual reality, and interactive media, have significantly expanded the tools available for visual communication, enhancing its capacity to reach and engage audiences (Li et al., 2017). These tools enable immersive storytelling techniques that can present real-life scenarios in an impactful manner, which is particularly beneficial for educating audiences on health risks and preventive measures. As Brinn and Newton (2019) note that animation and interactive design contribute not only to visual appeal but also to the effectiveness of message delivery, especially when conveying public health information.

### **2.5.3 Visual**

The visual aspect of communication encompasses the use of imagery, colour, typography, and layout to convey messages effectively. Visuals play a fundamental role in capturing attention and enhancing comprehension, especially when addressing complex topics or reaching diverse audiences (Dirkson, 2016). For instance, colour schemes are often strategically chosen to evoke certain emotions or highlight specific parts of a message, which can increase message retention and engagement (O'Connor, 2015). Visuals, therefore, serve as essential tools in helping audiences process information more quickly and retain it more effectively than text alone. In the context of health communication, visuals are crucial for simplifying medical information, making it accessible to people with varying levels of health literacy. Research has shown that well-designed visuals can break down language barriers and improve understanding in public health campaigns, as seen in the successful implementation of infographic-based education on disease prevention (Okan et al., 2021). Additionally, the use of illustrations, diagrams, and other visual aids can guide the viewer's attention

to key information, thus facilitating better recall and decision-making (Fong et al., 2017).

Today's digital tools, such as 3D animation, enable even more dynamic and engaging visuals that can demonstrate scenarios realistically and interactively, making them particularly valuable in areas like health education (Lee & Kim, 2019). This technological advancement allows public health campaigns to visualize information in immersive formats, fostering a stronger impact on audiences and promoting better retention of critical health messages (Krok & Åkerström, 2022).

The use of engaging visuals cues as the vivid environment of the study area and the characters aided the development processes and procedures employed for the 3D animation.

#### **2.5.4 Communication**

Communication is the process by which information is shared and understood between individuals or groups, often involving the use of verbal, non-verbal, and visual cues to enhance clarity and engagement (Littlejohn et al., 2021). Effective communication is central to conveying messages clearly and persuasively, especially in contexts that require audience awareness and understanding, such as health campaigns (Schiavo, 2021). For messages to resonate with audiences, communicators must consider factors such as cultural relevance, language, and the medium of delivery, as these can significantly influence how the information is received and processed (Neuliep, 2020).

In health-related contexts, strategic communication is vital to ensuring that essential information, like disease prevention methods, reaches the intended audience

and prompts appropriate action (Schiavo, 2021). Studies show that health campaigns are more successful when they incorporate tailored messages that address the specific concerns and motivations of different demographic groups (Noar et al., 2020). Communication tools like storytelling, relatable characters, and simplified language can further enhance message reception by making the content accessible and engaging (Braddock & Dillard, 2016).

Advancements in digital technology have introduced new forms of communication, such as interactive and multimedia approaches, that enable deeper audience engagement and promote active information retention (Ryan, 2020). In particular, 3D animation and other visual media have expanded the ways messages can be communicated effectively, allowing complex topics like disease prevention to be presented in visually engaging formats that improve audience understanding and recall (Meppelink et al., 2015). Through these evolving strategies, communication continues to adapt and play a crucial role in public health and other fields requiring widespread audience outreach.

Animation falls under one of the numerous visual means of communication. This study heavily considered the essence of communication and its impact on communicating visually.

### **2.5.5 Modes and Channels of communication**

Communication hinges on modes and channels. The various channels and modes of communication pertain to the ways in which information is sent and received. There are three main types of communication channels: written, non-verbal, and verbal (Dingwall et al., 2019). Spoken words are used in verbal communication, whereas

written words are used in written communication. Body language, tone of voice, and facial expressions are examples of nonverbal communication. Additionally, communication channels can be classified as rich or lean, formal or informal, and official or unofficial (Knowledge Hut, 2024).

Lean communication channels offer less information and delayed feedback, whereas rich communication channels offer a lot of information and quick response (Sheer, 2015). The type of message, the audience, the requirement for a permanent record of the communication, the level of confidentiality, and the communication's cost all influence the choice of communication channel (Turetken et al., 2019).

Informal channels are unofficial channels of communication, whereas formal channels are official channels. Unofficial channels are used for social, sports, political, and private communication, while official channels convey information such as an organization's objectives, policies, and procedures (Knowledge Hut, 2024).

Kapur (2020) studied the types of communication. The study's primary goal was to comprehend the various forms of communication. It was evident that different forms of communication are used when people from different backgrounds and categories communicate with one another. The study stated some types of communication which include written communication, non-verbal communication, feedback communication, visual communication, active listening, face-to-face and oral communication, informal communication, written communication, and oral communication over a distance. The languages spoken by the deaf community are sign languages. Individuals who experience hearing loss or speech difficulties communicate through sign languages. It is essential that the people maintain their typical facial expressions when speaking. The people must be well-aware of the various forms of

communication. They also need to understand the kinds of communication that are appropriate in different contexts and settings. The kinds of communication that are used depend on the goals that must be achieved through the use of various forms of communication, as well as the needs and requirements of the individuals. The following major topics were considered in the study: types of communication, their meanings, communication through sign languages, and communication through facial expressions.

In 2019, Dingwall et al. wrote a book on *Professional Communication*. The researchers' study touched on important aspects of communication. The book presented the concept of communication, getting to know target audience, choosing a communications channel, crafting your message with plain language, using visuals to communicate to target audience, the act of writing and presentation of information.

Birt (2023) in a study also accessed seven (7) essential channels of communication in the workplace. Birt outline In-Person, Documents, Emails, Instant Message Platforms, Videoconference, Phone calls and social media. This study reviewed In-Person, Documents and social media since there are the channels that directly have a connection with the study.

According to Birt (2023), *In-person* conversations are one of the most effective channels of communication in the workplace. Speaking with someone face-to-face makes it easier to convey the conversation's tone. Written or digital communication can occasionally be unclear in tone and intent, which can cause misunderstandings and even confusion. When conversing face-to-face, your body language and voice tone can help make your words more understandable. Speaking with someone face-to-face allows for

a back-and-forth narrative and is useful when sharing sensitive or potentially confusing information.

*Documents* are another common communication channel for people during any communication activity to aid understanding. This channel of communication is often used to send benefits and evidence of the message under discussion. This study revealed that posters and brochures/leaflets are the documents health officers usually use in educating community members on the spread and prevention of Malaria.

*Social Media* platforms are popular ways to communicate, and individuals and businesses use them to stay in contact with customers, communicate about new products and promotions and increase their overall brand awareness. Social media gives people the opportunity to get access to various visuals to aid communication (Birt, 2023).

#### **2.5.6 Language in Communication and Advertising**

Communication is a language in itself. Language is a way of communication that helps human beings express and convey their thoughts, feelings, and emotions. The role of language in advertisement has been studied by Widyahening et al. in 2015. Widyahening et al. (2015) indicate that language creates and arrange reality. Since language brings things hidden to light, it transforms into reality. Language is also used to describe an individual's experience. Events, procedures, people, things, abstractions, quality, circumstances, and social relationships are all discussed in experience. Language is an important aspect of any form of advertisement.

Research indicates that language used in advertisements may have an effect on how customers behave. Studies have examined the effectiveness of the use of native

languages versus foreign languages in ads. Nederstigt, and Hilberink-Schulpen (2018) conducted a study titled “*Advertising done in a Foreign Language or the Consumers’ Native Language?*”. The purpose of the study was to determine whether native ads performed any better than those in other languages. Findings imply that proficiency in a foreign language is not the only requirement for success in advertising, and that proficiency in a foreign language may also influence efficacy.

A study by Oyesomi and Salawu in 2019 assessed the uniqueness of indigenous language in advertising: analysis of figurative language used in selected telecommunication Yoruba Advertisement in Nigeria. The researchers examined the distinctiveness of indigenous languages in their study, as well as the use of figurative language in Yoruba telecommunications advertisements to convey meaning. The study stated that there are several telecom providers in Nigeria namely MTN, Airtel, GLO, and 9 Mobile. MTN and Airtel, the top two operators with active subscribers, were selected for this investigation. The population of the study consisted of all MTN and Airtel Yoruba advertisements. The advertisements for MTN Smart Recharge and Airtel Goody Bags were selected at random. The figurative languages used in the Yoruba advertisements for MTN Smart Recharge and Airtel Goody bag were examined using qualitative textual analysis. The researchers recommend among others that telecommunication companies pay serious attention to the use of figurative language that has the power to attract the audience to the services of the telecommunication agencies.

Holmqvist (2011) studied “*Consumer language preferences in service encounters: a cross-cultural perspective*”. The study analysed consumer language preferences across four language groups. Quantitative and qualitative approaches were employed to conduct the study. The study revealed that the use of first language in

service encounters is preferred by consumers in all four language groups. However, the reasons for preferring first-language use differ between countries. Language is shown to have emotional connotations for consumers that go beyond mere communication.

Heo, Jogaratnam and Buchanan, (2004) looked at customer-focused adaptation in New York City hotels. The study explored the perceptions of Japanese and Korean travelers. The study concluded that product specific adaptations such as providing menus, magazines and hotel directories in the guest's native language can make the difference in creating a satisfied traveler. The study emphasized the essence of language in advertising. Ting-Toomey and Dorjee (2018) and Nkwachuku (2015) also expressed that languages are rich in illustrations and explanations.

The studies above clearly justify the essence of the use of local languages in the conduct of some research. The researcher noticed that employing the dominant local language *Fante* for the voice-over used in the animation would aid in the buy-in of the community members.

## **2.6 Visual Storytelling**

Visual storytelling uses images, sequences, and visual elements to convey a narrative, engaging audiences by evoking emotions and fostering understanding through relatable visuals (Krum, 2021). It has become a powerful method for communication across many fields, including education, marketing, and health campaigns, as it allows complex information to be conveyed in a more digestible, memorable format (Müller & Schneider, 2019). Visual storytelling builds connections with audiences by illustrating real-life situations and issues through dynamic visuals, creating a more immersive experience that enhances message recall and engagement (Yoo & Kim, 2019).

In public health campaigns, visual storytelling helps transform statistical data and preventative information into relatable narratives, making it easier for audiences to connect with the material on a personal level (Bekker et al., 2020). Studies show that storytelling can be particularly effective in promoting health behaviours, as it enables audiences to visualize the impact of actions and decisions, thereby reinforcing positive behavioral change (Braddock & Dillard, 2016). When animated visuals are integrated with storytelling elements, they can create a compelling narrative that captures attention and foster understanding, especially among audiences with varying literacy levels (Meppelink et al., 2015).

Recent advancements in digital media, particularly in 3D animation, have broadened the possibilities for visual storytelling, allowing more realistic and complex portrayals of health-related information (McGuire, 2022; George & Hoffman, 2015). For instance, 3D animation can depict scenarios such as disease transmission and prevention measures in a clear, engaging way, helping audiences to visualize and understand preventive practices more effectively (Chen et al., 2020).

Visual storytelling through 3D animation as employed by authors (McGuire, 2022; George & Hoffman, 2015; Chen et al., 2020, etc.) mentioned above can thus be a valuable tool in health communication, enabling audiences to grasp critical messages through engaging and memorable narratives.

## **2.7 Animation**

Animation is a dynamic medium that brings concepts to life through movement, colour, and visuals, making it an effective tool for engaging audiences and enhancing message retention (Ware, 2021). As an evolving art form, animation has expanded

beyond entertainment and is widely used in education, health communication, and marketing to simplify complex ideas and foster understanding (Sankey & Bui, 2022). Animation's versatility allows it to visually represent processes or ideas that are otherwise difficult to communicate through static images or text, offering an immersive experience that captures attention and promotes learning (Lester, 2021).

In public health, animation has proven particularly useful for illustrating medical processes, health risks, and preventative measures, enabling audiences to visualize critical health information that might be challenging to convey otherwise (King et al., 2016). Research has demonstrated that animated content can effectively communicate public health messages by simplifying medical jargon and providing visual representations of health issues, which can improve comprehension and recall (Kim, 2020). For instance, animated sequences can show how diseases spread or how certain health practices, like handwashing, can prevent illness, making abstract health concepts more concrete and memorable for diverse audiences (Meppelink et al., 2015; Braddock & Dillard, 2016).

The introduction of 3D animation has further transformed the field by offering realistic, interactive, and visually appealing content that enhances audience engagement. This technology allows for detailed representations that can more accurately simulate real-life scenarios, which is invaluable for educating audiences on health-related behaviours (Phan et al., 2019). For example, in Malaria awareness campaigns, 3D animation can depict the life cycle of Malaria-carrying mosquitoes and the preventive actions people can take, thus making the information more accessible and impactful (Phan et al., 2019).

This study adopted 3D animation to provide the kind of realism and real-life scenes that invokes the acceptance of the participants.

### **2.7.1 History of Animation**

The history of animation dates back centuries, originating with early attempts at depicting motion through sequential images, as seen in ancient artifacts like cave paintings and pottery (Bendazzi, 2016). The concept of animation gradually evolved with inventions like the zoetrope and the phenakistoscope in the 19th century, which used rotating images to create an illusion of movement, marking the beginning of modern animation techniques (Bendazzi, 2016). By the early 20th century, animation had advanced with the creation of hand-drawn frames, as seen in works by pioneers like Winsor McCay, whose 1914 animated film *Gertie the Dinosaur* showcased how sequential art could create lifelike motion (Sumampouw & Pratama, 2024).

The development of animation continued with significant contributions from studios such as Walt Disney, which revolutionized the industry by introducing synchronized sound with *Steamboat Willie* in 1928 and pioneering full-length animated films, beginning with *Snow White and the Seven Dwarfs* in 1937 (Bendazzi, 2016). These innovations set new standards for storytelling, character development, and visual artistry in animation, making it a popular medium for both entertainment and education. By the latter half of the 20th century, animation experienced another transformative phase with the advent of digital technology, leading to computer-generated imagery (CGI) and 3D animation. The 1995 release of *Toy Story* by Pixar marked the first fully computer-animated feature film, showcasing the potential of digital animation to produce detailed, realistic visuals and complex storytelling (López et al., 2018; Furniss,

2017). When the shift to digital animation began in the late 20th century, software such as Adobe Flash has also redefined the production process, allowing for more efficient workflows (López et al., 2018; Furniss, 2017). Advancements in software and technology have made animation more accessible, leading to its use in various fields beyond entertainment, including advertising, education, and public health (Lester, 2021).

Today, animation is an integral part of visual communication, benefiting from continuous technological advancements that allow for more interactive, realistic, and immersive experiences. This evolution reflects animation's adaptability and its expanding role in conveying information, shaping perceptions, and enhancing learning across diverse sectors (Beane, 2019). The interactive and realistic nature of animation has the power to influence meaning.

### **2.7.2 Types of Animation**

Animation encompasses a variety of types, each with unique methods and applications, contributing to its versatility in visual storytelling and communication. Traditional animation, or hand-drawn animation, involves creating individual frames by hand to simulate motion, an approach popularized by early animation studios and known for its distinct aesthetic and labor-intensive process (Williams, 2019). Although time-consuming, traditional animation is still celebrated for its artistic quality and is used in some niche productions today, particularly in educational and artistic films (Sumampouw & Pratama, 2024).

There are several types of animations. They are traditional animation, 2D animation, 3D animation, Stop Motion animation and Motion graphics. Other researchers also add whiteboard animation as a type.

Stop-motion animation as another notable type of animation involves physically manipulating objects and photographing each movement incrementally to create motion, resulting in a tactile, handcrafted look. This form of animation has been popularized through films using clay models, puppets, or real-world objects, making it ideal for creative projects with unique visual textures (Pallant, 2019). Recent stop-motion films have utilized advanced techniques, blending it with digital effects to enhance realism while preserving the craft's handmade aesthetic (Leader, 2018).

Computer-generated animation, often referred to as 3D animation, has transformed the animation industry by enabling the creation of lifelike characters and complex visual effects through digital software. This type allows for high levels of detail, movement, and interaction, which is particularly beneficial in fields like healthcare and engineering, where realistic simulations can aid in education and training (Beane, 2019). The flexibility of 3D animation has made it the industry standard in film, gaming, and educational media due to its potential for creating immersive, interactive experiences (Teplá et al., 2022).

Additionally, 2D digital animation, which involves creating flat, vector-based images on computer software, remains popular in television, advertising, and educational videos. This technique is less labor-intensive than traditional hand-drawn animation and offers smoother transitions, making it a practical choice for conveying information quickly and clearly (Winder & Dowlatabadi, 2020). Unlike 3D animation, 2D animation offers a more stylized approach, which can be effective in delivering clear

messages and maintaining viewer engagement without overwhelming visual detail (McGuire, 2020; Cholodenko, 2016).

Motion graphics is another form of animation that focuses on moving text and graphic elements rather than character-driven narratives, commonly used in advertising, social media content, and instructional videos. This type emphasizes clarity and simplicity, making it suitable for communicating information efficiently, especially in environments where audiences are likely to consume content quickly (McGuire, 2020). The popularity of motion graphics has grown with the rise of digital marketing, as it provides a cost-effective way to create engaging, animated content with minimal resources (McGuire, 2020).

The evolution of animation software has significantly shaped the animation industry, enabling artists to transition from traditional, manual techniques to digital methods. Early animation relied heavily on hand-drawn frames and physical manipulation, which was both time-consuming and costly. The introduction of animation software in the 1980s revolutionized the field, starting with programs like Autodesk's AutoCAD, initially developed for engineering but soon adopted for animation due to its ability to produce detailed 2D and 3D models (Beane, 2019).

In the late 1980s, Autodesk also released 3D Studio (later known as 3ds Max), one of the first widely accessible 3D modelling tools, which allowed animators to create intricate 3D environments and characters (Chan, 2020). Around the same time, Adobe introduced After Effects, enabling users to incorporate motion graphics and visual effects, which proved instrumental for digital animation and has remained a staple in the industry (Adobe, 2019).

With the release of Pixar's Toy Story in 1995, a landmark in fully computer-generated animation, Autodesk's Maya became the preferred software for 3D animation due to its versatile toolset and realistic rendering capabilities (Lasseter, 1998). Maya's ability to handle complex simulations made it indispensable for both film and television productions. Adobe's Flash (later rebranded as Adobe Animate) also gained popularity in the late 1990s for web-based animations, particularly for internet cartoons and advertisements, offering accessible, vector-based animation tools (McGuire, 2020).

The 2000s saw further developments with software like Blender, an open-source 3D animation program that democratized access to high-quality animation tools, appealing especially to independent creators and smaller studios (Beck, 2017). In recent years, software like Toon Boom Harmony has advanced 2D animation, integrating features like rigging and deformers to allow animators to create high-quality work with streamlined processes (George, 2019). Innovations continue with real-time rendering engines such as Unreal Engine and Unity, which enable animation for interactive applications like virtual reality and video games, transforming the possibilities of real-time 3D animation (Lanier, 2019).

This progression of software has expanded animation's applications across fields, from entertainment to education, and continues to influence how animators produce, conceptualize, and distribute content.

Research entitled "UNISI Promotional Media Advertising Based on 2-Dimensional Animation" (Nuriman & Prasetyo, 2021) produced a 2-dimensional animation advertisement with a goal to inform people about the qualities of UNISI. The advertisement was produced using Adobe After Effects, Adobe Premiere, and Adobe

Illustrator. The research results showed that 2D animation commercials used by UNISI was more effective than using pamphlets and billboards as their promotional media.

A study entitled “Making 2D Animation Advertisements for Ant Sugar Products for the Jatirog Multi-Business Cooperative, Kulon Progo” (Toil & Purwanto, 2015), produced a 2-dimensional advertisement to be used as a promotional video of *Gula Semut (Ant Sugar)* for *Koperasi Serba Usaha (Multi-Business Cooperative)*. The advertisement was made using Adobe Flash CS4, Adobe Premiere Pro CS4, Adobe Audition 1.5, Adobe Illustrator CS4, and Adobe Photoshop CS4. There were three (3) steps in the production process; the pre-production, production, and post production process. The methods used to gather data in this research was the observation method, interview method, and literature review. The research results in a 30 second advertisement for *Koperasi Serba Usaha (Multi-Business Cooperative)*.

In a research study by (Putra & Purwanto, 2015) entitled “Making a 2D Animation Film Entitled Four Monsters in the Amikom Multimedia Community Surakarta”, the researchers produced a 2-dimensional animation film titled “Four Monster”. The animation was produced through 3 production steps, which are, the pre-production, production, and post-production phase. The methods used for gathering data were observation, interview, and literature review.

This current study adopted the methods used to gather data and also the three (3) production steps in developing animation employed by both Putra and Purwanto (2015), and Toil and Purwanto (2015) in the execution of the project. Furthermore, this study also used Adobe Premiere Pro and Adobe Photoshop as a support application for production just as was employed by Nuriman and Prasetyo (2021), and Toil and Purwanto (2015).

A study by Au (2015) entitled ‘Animation: 2D versus 3D and their combined effect’ examined how 2D and 3D animation differs in character movement and space. Elements created in a 2D environment define 2D animation, whereas elements created in a 3D environment define 3D animation. The study observed that contemporary animated films combine the two genres for aesthetic impact, accelerated production, and overall convenience. Few movies directly compare the forms to show the variations in their perceived qualities, despite the fact that some contemporary animations blend the two in their exploratory search to find new animation forms. There is a clear difference between the two animation techniques in terms of artistic expression, realism, dimension, and detail. The study concluded that in terms of lighting, the 3D environment is determined by the science of illumination, whereas in the 2D environment, colour conventions create the illusion of lighting.

### **2.7.3 3D Animation**

3D animation is a powerful tool that has transformed the visual storytelling landscape, offering unparalleled realism and dynamic motion. Unlike traditional 2D animation, which uses flat images, 3D animation creates the illusion of three-dimensional objects within a virtual space, allowing for more complex visual effects and lifelike movement (Teplá et al., 2022). The process involves modelling, rigging, animating, and rendering, with each step contributing to the creation of realistic or fantastical environments and characters. It is widely used in various industries, including film, video games, education, and advertising, due to its ability to produce high-quality visuals that engage audiences in a more immersive manner (Sumampouw & Pratama, 2024).

One of the major breakthroughs in 3D animation came with the advent of programs like Autodesk Maya and 3ds Max, which allowed animators to create detailed models and animate them in a three-dimensional space (Beane, 2019). These tools have since become industry standards in both feature films and gaming, offering powerful features for character modelling, texture mapping, lighting, and rendering (Chan, 2020). Pixar's *Toy Story* (1995), the first fully computer-animated feature film, showcased the potential of 3D animation, combining technical innovation with engaging storytelling, and setting a precedent for future animated works (Lasseter, 1998). In addition to film and entertainment, 3D animation has made significant strides in other areas. It is now used extensively in medical simulations, architecture, and virtual reality (VR) to represent complex systems and environments, offering users an interactive and realistic experience (Sherman & Craig, 2018). For example, in the medical field, 3D animation is used to demonstrate surgical procedures or visualize anatomy, aiding in education and patient understanding (Cui et al., 2021). Similarly, in architecture, 3D visualizations allow clients to interact with potential designs before construction, ensuring greater accuracy and communication (Beane, 2019; Wang, 2018).

Moreover, 3D animation has a significant presence in the gaming industry, where it enables the creation of interactive environments and lifelike character animations that enhance player immersion (Villacis, 2022). With the rise of real-time rendering technologies, such as Unreal Engine and Unity, 3D animation has become even more accessible, allowing for faster production and the ability to integrate interactive elements in real-time environments (McGuire, 2020). The continued evolution of 3D animation software, coupled with advances in artificial intelligence and machine learning, suggests that the future of this medium will bring even more

sophisticated tools for creators, pushing the boundaries of what is possible in visual storytelling and interactive media (Teplá et al., 2022).

#### **2.7.4 Importance of 3D Animation**

3D animation plays a crucial role across multiple industries, offering numerous advantages that enhance visual storytelling, creativity, and communication. One of its key benefits is the ability to create realistic and visually compelling content. By using 3D models and simulations, animators can bring lifelike characters, environments, and objects to life, which is particularly useful in fields such as entertainment, education, and advertising (Teplá et al., 2022). Unlike traditional 2D animation, 3D animation provides depth and dimension, which helps audiences connect with the material on a more visceral level (Beane, 2019).

In the entertainment industry, 3D animation is instrumental in producing animated films, TV shows, and video games. It enables creators to build complex worlds and characters that would be impossible or highly costly to create using live-action techniques. For instance, blockbuster films like *Avatar* in 2009 and *Frozen* in 2013 owe much of their success to the immersive 3D animation techniques that allow for detailed rendering and lifelike movement (Lasseter, 1998; Prince, 2018). Furthermore, it enables more dynamic storytelling, where the animator has complete control over the environment and characters, ensuring that the narrative unfolds exactly as intended (Wells, 2019).

In education, 3D animation has become an essential tool for visualizing complex ideas and concepts. In subjects such as biology, chemistry, and physics, 3D models allow students to better understand abstract or invisible phenomena. For

example, medical animations help visualize how the human body functions or how diseases spread, making difficult subjects more accessible and engaging for learners (Mayer, 2020). Additionally, interactive 3D simulations are widely used in training scenarios, providing users with a safe and engaging way to practice skills in a virtual environment (Cui et al., 2021). Moreover, 3D animation is increasingly important in marketing and advertising, as it offers companies an innovative way to showcase their products and services. 3D animated advertisements are more engaging and visually stimulating than traditional formats, often capturing the audience's attention more effectively (Radianti et al., 2020). The use of animation allows brands to highlight the unique features of their products in a more interactive and memorable manner (McGuire, 2020). This is particularly relevant in industries such as automotive, technology, and consumer goods, where 3D animations can demonstrate product functionality and features that are difficult to explain with traditional media.

In the field of architecture, 3D animation helps architects and designers present their ideas to clients in a more immersive and understandable way. Rather than relying solely on blueprints or static images, 3D renderings provide a virtual walkthrough of the design, allowing clients to experience the space before it is built (Beane, 2019). This enhances communication between designers and clients, reducing misunderstandings and ensuring that the final product aligns with the client's vision.

The importance of 3D animation continues to grow, as advancements in technology and software offer even more possibilities for creative expression and problem-solving. With real-time rendering and virtual reality (VR) becoming more mainstream, 3D animation is poised to further transform industries by offering new ways to interact with content and explore complex scenarios in ways never before possible (Teplá et al., 2022).

## 2.8 Some 3D animation studio productions in Ghana

Ghana has seen notable growth in the animation industry in recent years, with several local studios contributing to the evolution of 3D animation within the country. Among these are studios like Anymax, Acute Formula, and Mills Media, which are leading the charge in creating innovative animated content for both local and international audiences.

Anymax is one of the pioneers in the Ghanaian animation scene, particularly known for its 3D animated series “*Tales of the Anansesem*”. This production stands out for its use of indigenous African folklore, blending traditional stories with modern animation techniques. Anymax has managed to bridge the gap between African culture and cutting-edge animation, making it one of the most recognized animation studios in Ghana. The studio’s work is a testament to the potential of 3D animation in storytelling that resonates with both local and global audiences.

Acute Formula is another key player in the Ghanaian animation industry. The studio is involved in a range of projects, from animation for advertising to educational content. Acute Formula is recognized for using 3D animation in digital marketing campaigns, often producing visually engaging adverts for both local and international brands. Their work showcases how 3D animation can effectively convey complex ideas in an appealing and easy-to-understand format. In addition to commercial projects, the studio has ventured into creating animated films, contributing to the growing presence of animated content in Ghana’s entertainment sector.

Mills Media, known for its diverse media productions, also contributes significantly to the local animation industry. Mills Media's animation projects span both 2D and 3D productions, and the studio has been involved in several high-profile

projects, including educational animations aimed at raising awareness on social issues. The studio's focus on creating animation that is both entertaining and informative has helped build a niche for animated content that educates and entertains audiences in Ghana. Mills Media's productions, such as Mills' Animations, are part of the movement to use animation as a tool for social change.

The work being done by these studios not only highlights the talent and creativity present in Ghana but also signals a growing recognition of the power of 3D animation to influence and engage audiences. As the animation industry continues to grow, the contributions of these studios will undoubtedly play an important role in shaping the future of digital media in Ghana and across Africa.

## **2.9 Animation and Advertising**

The literature review on advertising and animation focuses on the effectiveness and impact of using animation in advertising. Animation has been found to have positive impacts on recall, recognition, and memory in TV commercials, web banners, and posters (Goel & Upadhyay, 2017).

Goel and Upadhyay (2017) conducted a review on the effectiveness of use of animation in advertising. According to these researchers, still pictures and objects are made to move through the use of technology known as animation. In advertising, cartoons are displacing real-life celebrities. Although people are drawn to animated characters, many are unaware of the genre, types, and benefits of animation in advertising. The goal of the study was to close this knowledge gap by comprehending the fundamental ideas behind animation and its application in advertising. Additionally, an effort has been made to determine how successful the use of animation in advertising

is. The study provided an explanation of the animation concept. In addition to its effectiveness in terms of various factors like attention, recall, click through rate, etc., other benefits offered by the use of animation in advertising have also been discussed. The conclusion of this paper offers a number of research and managerial implications.

According to Goel and Upadhyay (2017), Animation can be used to associate with the audience in a fun and innovative manner, making it an excellent method for enhancing knowledge and marketing. The use of anime in advertisements has become one of the most effective marketing strategies in Japan, with its implementation in various fields to improve knowledge and marketing. Animation advertising requires empirical studies to further explore its role and effectiveness, especially in India. Animation can influence green brand love and green customer citizenship behavior when used in green animation advertising.

The effectiveness of animation in advertising has been studied in internal and external factors related to customer awareness and intention behavior. Hushain et al. (2023) argue that animated advertisements have advantages in today's advertising world, as they can render and present information more effectively. Goel and Upadhyay (2017) conclude that animation has been found to be more effective than still pictures and objects in attracting consumer attention.

Hushain et al. (2023) studied the advantage of animated advertisements in Today's Era. The authors argue that animation is without a doubt one of the most important advertising trends and techniques of the modern era, and it's growing rapidly. There's no need to wonder why that is the case when animated commercials provide an entertaining video in addition to being promotional. The sights and motion will keep the consumer's attention riveted. The study examined the differences and similarities between animated and traditional forms of advertising commercials. The study

concluded that modern businesses incorporate animated commercials into their digital marketing strategies in order to guarantee strong sales for their services and goods.

Cook and Thompson (2019) edited a book titled *'Animation and Advertising'*. The chapter one gave an introduction to animation and advertising. The introductory chapter makes the case that animation's use for advertising has essentially shaped the medium throughout its history. It draws attention to significant instances of this interaction from well-known animation histories while simultaneously highlighting the vast amount of animation produced that has not gotten much recognition up to this point. Not only was animation shaped by its use in advertising, but the process of using it for that purpose also shaped advertising, and this section discusses the theoretical and practical ways in which animation was influential. The balance between logical communication and emotional appeal, the (in)visibility of animation in advertising, the significance of the commodity object and animated spokespeople, and the roles of gender, race, and nation are some of the major issues that emerge from the collection as a whole.

The researchers reviewed studies above have all established that animation and advertising cannot be decoupled in today's world since animation in itself has been primarily shaped by its use for advertising. Other researchers have also studied the influence of animation in learning and advertising, and also using animation as a tool in advancing health literacy.

Ainsworth (2008) studied how animations influence learning. Ainsworth connotes those new forms of representation, like animation, multimedia, and virtual reality, are among the major innovations made possible by educational technology. Every new representation is welcomed with great enthusiasm at first, but as research on

how it affects learning processes and outcomes yields inconsistent results, this enthusiasm starts to wane. The author contends that one must take into account several interrelated levels of explanation in order to fully comprehend how various representations affect learning. The study offered a framework that uses animation as an example of an innovative educational representation method to show these levels. According to the study, animations may create an illusion of understanding that can obstruct effective learning, according to some evidence, rather than providing learners with the support they need to achieve effective metacognition. There is conflicting data regarding the rhetorical roles that animations can play in promoting social learning; some researchers find that effective communication has increased, while others find that it has decreased.

Ainsworth (2008) study shows that at least there is effective evidence of some degree of learning when animation is used as the major learning tool even though there is conflicting data regarding the rhetorical roles that animations play in promoting social learning.

Kochhar (2019) studied the influence of animation in the Indian advertising industry. The study employed both qualitative and quantitative research approaches in its execution. The study interviewed twenty (20) experts; ten (10) from both advertising and animation industry. Five hundred and three (503) respondents were involved in the survey using a questionnaire. The study revealed that animation plays a key role in the advertising of India. The study also showed that viewers are drawn to advertisements with animation because it sets them apart from other forms of advertising. Additionally, it has been discovered that the rise in startup culture and brand competition has contributed to animation's acceptance in contemporary advertising. The study further showcased that animation is a powerful medium for promoting such things because it

transcends boundaries of culture, language, and location. The Indian audience accepts animated characters because they transcend religious and cultural boundaries. Therefore, the use of animation in awareness-type advertisements makes them more effective.

A study by (Sharma, 2016) entitled ‘The importance of animation as a visual method in Advertising’ studied how animation was used by businesses to create ads, because animation is seen by the researcher as eye-catching, trendy, unique, and less tedious to develop as compared with filming real human beings for ads. The researcher connotes that animation methods also have the advantage of creating visuals only limited to our imagination and are not restricted by the limited possibility when advertisements are created by a camera crew. The study also discussed how the use of animation for ads affects the young and old regardless of age in promoting a product.

A study entitled “*Is animation effective for advertising offensive products? Insights from an internet advertising experiment*” by (Rakrachakarn & Moschis, 2015) also sought to find out how effective animations were in advertising offensive products. The research mentioned that several studies have provided proof to support the positive effects of the use of animation for advertisements. The research suggested that advertisement using animation result in a favorable attitude towards the ad, the brand, and the purchase intention.

Champoux (2005) carried out a comparative analysis of live-action and animated film remake scenes: finding alternative film-based teaching resources. The article discussed, analysed and compared scenes to identify parallel film scenes that are useful for teaching. The study concluded that while animated scenes provide a strong symbolic meaning of theories and concepts, live-action scenes present a view of

reality. Given that the animated sequences under discussion are typically shorter than the live-action remake(s), animated movies may be a more effective teaching tool.

Majority of the literature above employed qualitative research and others used quantitative for their studies. The studies also made conscious references to the cultural impact on the setting in the animations developed. The suggestions by most of the authors show that animation has the potential to improve health literacy. This makes this study's sole objective of creating an animation to increase awareness in the prevention and spread of Malaria in Effutu very essential.

In conclusion, the use of animation in different forms of media, such as posters, web banners, and, TV commercials, has been explored, and its effectiveness in green advertising has also been investigated. Animation has shown to be effective in advertising, with various studies highlighting its positive impacts on recall, recognition, and memory.

## **2.10 Animation for health communication education, language and culture**

An increasing number of people and organisations are realising that animations are useful tools for communicating health to human beings. Animations are able to entertain and educate audiences while it also has the power to demystifying difficult ideas. Moe-Byrne et al. (2022) argue that research has shown that animations are better at communicating complex biological processes to patients than traditional methods. It has been discovered that spoken animation works best when conveying complex health information to individuals with low health literacy (Balken, 2022). Animations can be used to break down difficult ideas and educate viewers in an entertaining manner.

Moe-Bryne et al. (2022) conducted a study entitled ‘The effectiveness of video animations as information tools for patients and the general public: A systematic review’. The study compared the effectiveness of video animations as information tools vs. other formats of delivery on patient knowledge, attitudes and cognitions, and behaviours. The study employed the quantitative approach to research. The study used 2D animated videos. 3D animated models and white board animations for the execution of the research. The results show some beneficial effects on attitudes and cognitions as well as primarily positive effects on knowledge, especially in the short term. Additionally, they show primarily favorable effects on behavior, despite the fact that only nine trials were used to assess this result. There is hardly any proof that animations have a negative impact on patient outcomes.

Meppelink et al. (2015) also did an experimental study on the effectiveness of health animations in audiences with different health literacy levels. The study’s aim was to investigate the features of spoken health animations that improve information recall and attitudes and whether there are differences between health literacy groups. The study was a quantitatively done. The study used cognitive theory of multimedia learning which suggests that human beings learn from words and pictures. The researchers’ study was conducted using 231 participants who are between age 55 and above with either low or high health literacy. The data was collected using an online experiment on the participants. The study also concluded that animations do not negatively influence high health literate audiences. This current study also employed cognitive theory of multimedia learning because animation consist of auditory text and visual pictures which have the power to get people to store information shared through animation in their memory better. Animation has the prowess to decrease cognitive

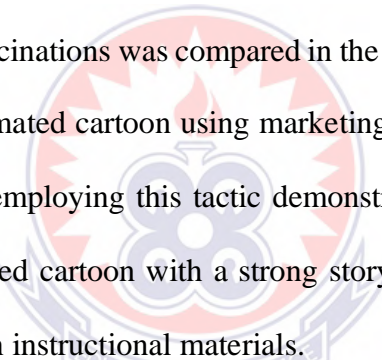
overload which hinders information processing because it comes with spoken text and visual images.

George et al. (2013) also studied the use of animation as an information tool to advance health research literacy among minority participants. The efficacy and acceptability of an animated video to improve minority multicultural populations' health research literacy were investigated in this qualitative study. The study was executed qualitatively, and examined the transcripts of fifty-eight (58) focus groups in Los Angeles, Hawaii, conducted by African Americans, Latinos, Native Hawaiians, and Filipinos in the United States. According to the researchers, the participants accepted the cultural appropriateness of the video and the animation. The results of the study showed that using animation to convey information about health research enhanced participants' capacity to recognize personal information gaps, have meaningful conversations at the community level, and pose questions regarding health research.

A study by Calderón et al. (2014) looked at how animation was used to improve Diabetes Health Literacy. An animated diabetes video in Spanish and English was created by the study. Its goals were to evaluate the efficacy of raising diabetes health literacy among Latino/Hispanic Americans and to qualitatively evaluate the suitability of the language and culture. The animated video was developed using animation production methods and a participatory research design. Focused group discussions were used to evaluate cultural appropriateness. According to the study, animation has a great deal of potential to improve diabetes health literacy among Latinos/Hispanics in USA with low levels of functional health literacy.

Schnellinger et al. (2010) on another hand compared animated videos vs pamphlet. This was to compare the success of educating parents about proper antibiotic use. The goal was to make an animated video that would teach parents on the proper use of antibiotics and assess how well-informed they were compared to parents who received a pamphlet from the American Academy of Pediatrics. The study employed the quantitative research approach. According to the study's findings, parents can learn about the proper use of antibiotics in an emergency department setting from an animated video that also helps them retain the information for a long time.

Leiner et al. (2004) conducted a study entitled 'Patient communication: a multidisciplinary approach using animated cartoons. The effectiveness of a printed message about polio vaccinations was compared in the study to the same message when it was made into an animated cartoon using marketing and advertising strategies. The output that came from employing this tactic demonstrated that, in the context of this investigation, an animated cartoon with a strong storyline conveys information more successfully than written instructional materials.



The preceding statement and the literature discussed above (Calderón et al. (2014), George et al. (2013) and Schnellinger et al. (2010) show that an animation that is well crafted putting into consideration the language, the cultural settings and backing the development of the animation with strong marketing communication strategies is very effective and can get the intended audiences to take the action of practicing the embedded message in an animation. This implies that animations play a crucial role in health communication by simplifying complex information, engaging audiences, and improving patient education and understanding.

### **2.11 How 3D Animation Can Be Used on Malaria for Visual Communication**

3D animation has proven to be an effective tool for visual communication in addressing complex health issues, including Malaria. By leveraging its ability to create detailed and realistic visuals, 3D animation can simplify intricate medical concepts and present them in an engaging and comprehensible manner. This makes it an invaluable medium for educating the public about Malaria prevention, treatment, and the biology of the disease.

One significant application of 3D animation is in illustrating the life cycle of the Plasmodium parasite, the mosquito-borne organism responsible for Malaria. Through realistic animated visuals, audiences can see how the parasite is transmitted by Anopheles mosquitoes, infects human red blood cells, and reproduces in the liver. Such detailed visualizations help viewers understand the disease's transmission cycle and why certain preventive measures, like using insecticide-treated bed nets and eliminating mosquito breeding sites, are crucial (WHO, 2019). Additionally, 3D animation can be used to demonstrate the mechanisms of antiMalarial drugs, showing how they work within the human body to combat the parasite. For example, animations depicting how artemisinin-based combination therapies (ACTs) target and kill the parasite can enhance patient comprehension and compliance with prescribed treatments (CDC, 2021). These animations are especially effective in healthcare settings, where clear communication between medical professionals and patients is vital.

In Malaria campaigns, 3D animation can create vivid public health messages that resonate with diverse audiences. For instance, animated public service announcements (PSAs) can highlight the importance of early detection, proper medication, and regular use of preventive measures. Animations are particularly useful

in regions with low literacy levels, as they rely more on visual storytelling than text-heavy content (UNICEF, 2020). Furthermore, animations can be adapted for various platforms, including social media, television, and educational materials, broadening their reach. Interactive 3D animations are another promising tool for Malaria education. Through simulations and virtual reality experiences, individuals can learn how to identify symptoms, administer first aid, or use insecticide sprays effectively. These interactive tools create memorable learning experiences that encourage community participation and long-term behavior change (Lee et al., 2021). Moreover, 3D animation can aid in research and advocacy. By visualizing data trends, such as the prevalence of Malaria cases or the impact of interventions, animated infographics, and simulations help policymakers understand the scope of the disease and prioritize resources effectively. This is especially important in countries with high Malaria burdens, where decision-makers need clear and impactful visual aids to guide their strategies (Gavi, 2022).

In summary, 3D animation enhances Malaria-related visual communication by offering detailed, accessible, and engaging representations of the disease's biology, prevention, treatment, and societal impact. Its versatility allows it to reach a wide audience, making it a critical component of modern public health campaigns.

## **2.12 Benefits of using animation in advertising**

The idea of animation is about creating an illusion of movement. It is a method of creating the illusion of movement by forming successive drawings or models in a sequence. The sequence of the successive drawings shows the intended illusion of

movement. Suyanto (2005) says animation is the use of digital devices like computers to create movement on screens.

Using animations, videos, and still images when providing health information can help patients understand their health better than words (Moe-Byrne et al., 2022). Studies show that graphics and animations improve knowledge and fact recall about certain health measures (Schnellinger et al., 2010; Leiner et al., 2004).

There are several benefits of using animation in advertising, including:

*Increased effectiveness:* Animation is more effective than still pictures and objects in attracting consumer attention. Animation are 4.6 times more effective than static ads

*Stand out from the crowd:* Using an animated ad immediately sets your business apart from others who advertise through more generic means. Furthermore, you are establishing a positive first impression with people experiencing your brand for the first time.

*Timelessness:* With animation, your ads are timeless regardless of star power. While many companies use star power to energize their advertising campaigns, the campaign ends as soon as the celebrity's career ends.

*Conveys complex ideas easily:* Animation is a handy tool for advertising your business; it is a simple way of telling your audience who you are and what you do. By using animation, you can avoid using large pieces of text and make it more appealing to your audience. This will allow you to tell your audience complex information and broad ideas in a more straightforward format.

*Versatility:* Animation is a versatile tool for reaching a broader audience; with its fun and highly creative look, they appeal to adults and children. When you create an animation to attract a larger audience, you have the opportunity to make your company stand out against your competitors.

*Consumer-brand interaction:* Animated ads are the best way to show experiences to the client. Through animated videos, you can show potential clients what are the benefits they will get by consuming your product or service.

In conclusion, using animation in advertising has several benefits, including increased effectiveness, standing out from the crowd, timelessness, conveying complex ideas easily, versatility, and consumer-brand interaction.

### **2.13 3D Animation as a Visual Communication Tool for Reaching Mass Audiences and Mass Communication**

3D animation has emerged as a powerful tool for visual communication, particularly in reaching and influencing mass audiences. Its ability to combine realism, creativity, and technical sophistication allows it to communicate complex ideas effectively and memorably. This makes 3D animation an essential medium for mass communication, addressing diverse audiences across various cultural and linguistic backgrounds.

One of the significant advantages of 3D animation in mass communication is its capacity to create compelling narratives that resonate with audiences. Through animated characters, engaging storylines, and lifelike visuals, it can evoke emotions, convey messages, and inspire action. For instance, public health campaigns have successfully used 3D animation to raise awareness about critical issues such as

vaccination, disease prevention, and environmental sustainability. These campaigns are impactful because they deliver messages in a visually appealing and easy-to-understand format, capturing attention across age groups and demographics (WHO, 2020). Moreover, 3D animation is highly versatile, making it suitable for various platforms, including television, social media, and digital billboards. In the era of digital communication, where visual content dominates, animated videos and infographics are more likely to be shared, liked, and remembered. This adaptability ensures that 3D animation can reach both local and global audiences, amplifying its effectiveness as a mass communication tool (Leiner et al., 2004).

The technology also plays a critical role in education and advocacy. Animated content can simplify complex topics such as scientific phenomena, historical events, or social issues, making them accessible to broader audiences. For example, animated documentaries and explainer videos are increasingly being used in educational campaigns to enhance public understanding and engagement (UNICEF, 2019). These tools not only inform but also encourage dialogue and participation, which are vital for societal progress. Furthermore, 3D animation supports interactive communication, enabling audiences to engage actively with the content. Interactive animations, often integrated into websites, mobile applications, or virtual reality experiences, allow users to explore topics at their own pace. This personalized approach increases retention of information and fosters a deeper connection with the message being conveyed (Lee et al., 2021).

In the realm of mass communication, 3D animation has also revolutionized advertising and branding. Companies use it to create unique and memorable campaigns that stand out in crowded media spaces. Animated commercials are particularly effective in product demonstrations, as they can visually illustrate features and benefits

that would be challenging to convey through traditional means (Lee et al., 2021). By combining aesthetics and functionality, 3D animation bridges the gap between entertainment and information, ensuring that messages are both engaging and persuasive.

In conclusion, 3D animation serves as a transformative visual communication tool that excels in reaching and engaging mass audiences. Its versatility, emotional appeal, and capacity to simplify complex messages make it indispensable for mass communication in education, advertising, public health, and advocacy.

## **2.14 Animation Software and Production Practices**

### **2.14.1 Autodesk Maya 3D software**

Autodesk Maya is one of the most advanced 3D modelling, animation, and rendering software used in various industries, including film, television, video games, and architectural visualization. Maya was first developed by Alias Systems Corporation in 1998 and later acquired by Autodesk in 2005, Maya has consistently evolved to incorporate cutting-edge tools for creating lifelike animations, complex simulations, and detailed 3D environments (Autodesk, 2015). The software offers an extensive set of features, such as dynamic simulation, character rigging, and animation workflows, which enable users to develop high-quality content efficiently. Maya is particularly renowned for its flexible node-based architecture, which allows users to customize processes and create complex effects through procedural workflows (Gould, 2005).

One of Maya's strengths is its integration with other software and plugins, including rendering engines like Arnold and V-Ray, and compatibility with Adobe tools like After Effects and Photoshop. These integrations make it a versatile platform for

end-to-end production, from initial design to postproduction. It is also equipped with a powerful scripting environment using MEL (Maya Embedded Language) or Python, allowing artists and developers to automate repetitive tasks and create custom tools (Derakhshani, 2016). Maya is widely used in the animation industry, evidenced by its role in producing critically acclaimed films and series. Its advanced simulation tools for particles, fluids, and hair provide a level of realism essential for creating visually compelling content. Furthermore, its extensive library of tutorials and community support ensures that users can continually develop their skills and adapt to evolving industry trends (Lee et al., 2020).

In addition to entertainment, Maya plays a critical role in education and training, where it is utilized to teach 3D modelling and animation principles to aspiring designers and animators. As technology continues to evolve, Autodesk consistently updates Maya to incorporate new features, such as real-time rendering and artificial intelligence-driven enhancements, ensuring its relevance in the dynamic field of 3D design (Autodesk, 2021).

#### **2.14.2 Character Modelling**

Character modelling is a fundamental aspect of 3D animation, involving the creation of digital characters that can be animated for films, video games, and other media. This process begins with designing a character based on concept art, which provides a visual guide for the 3D model. The modelling process often employs tools such as Autodesk Maya, Blender, or ZBrush to sculpt and refine the character's form, ensuring accurate proportions, anatomy, and details (Derakhshani, 2016).

In Maya, character modelling is achieved through a combination of polygonal modelling and sculpting techniques. Polygonal modelling involves constructing the

character using vertices, edges, and faces, which can then be smoothed and subdivided to create organic forms. The software also allows for the integration of advanced sculpting features, which are essential for adding intricate details, such as facial features, wrinkles, or textures (Gould, 2005). Another key stage in character modelling is retopology, where the model's surface geometry is optimized for animation. Retopology ensures that the model's mesh structure allows for seamless movement during rigging and animation, which is crucial for producing realistic motion. Maya's tools enable artists to streamline this process, facilitating the creation of models that are both visually compelling and technically efficient (Autodesk, 2021). Texturing and UV mapping are also integral to character modelling. These processes involve creating surface details, such as skin, clothing, or hair, by applying 2D images onto the 3D model. Maya provides robust texturing tools and integrates seamlessly with software like Substance Painter, which allows for intricate texture creation and material application (Lee et al., 2020).

Character modelling extends beyond aesthetic design, encompassing technical considerations such as rigging, where a skeleton-like structure is added to the model to enable movement. Maya's rigging tools are highly customizable, allowing animators to craft characters capable of dynamic and expressive actions. These features, coupled with Maya's support for high-resolution rendering, ensure that character models meet the creative and technical demands of modern animation and game development (Derakhshani, 2016).

### **2.14.3 Character Texturing**

Character texturing is a crucial step in 3D animation, where two-dimensional images or materials are applied to a 3D model to define its surface properties, such as

colour, texture, and reflectivity. This process transforms the geometry of a character into a realistic and visually engaging entity by adding details like skin tone, fabric patterns, or environmental wear and tear. Tools like Autodesk Maya, Substance Painter, and Photoshop are commonly used for this purpose, offering powerful capabilities for creating detailed and dynamic textures (Gould, 2005).

The texturing process begins with UV mapping, a technique that involves unwrapping the 3D model's surface into a flat, 2D representation. This UV map acts as a template for placing textures accurately on the model. Autodesk Maya includes advanced UV mapping tools that streamline the creation of clean, efficient UV layouts, which are essential for avoiding texture distortions or seams (Derakhshani, 2016). Substance Painter, often integrated with Maya, allows artists to paint directly onto the 3D model, adding intricate details like pores, scars, or fabric fibers. This tool also supports procedural texturing, enabling the application of realistic weathering or aging effects with minimal manual effort. Additionally, its compatibility with physically-based rendering (PBR) workflows ensures that materials behave realistically under different lighting conditions (Lee et al., 2020). Maya's texturing pipeline also includes shader creation, where materials like metal, glass, or fabric are defined. This step is crucial for achieving specific visual effects and ensuring consistency across different rendering engines like Arnold or V-Ray. The software's node-based shader editor allows for precise control over material properties, enabling artists to create complex and lifelike surfaces (Autodesk, 2021). Character texturing extends beyond visual appeal, impacting the storytelling aspect of animation. For instance, textures can convey a character's backstory through details like scars or worn clothing, enhancing the narrative and emotional connection with the audience. By combining artistic

creativity with technical precision, character texturing plays a vital role in producing immersive and realistic animated content (Derakhshani, 2016).

#### **2.14.4 Character Animation**

Character animation involves bringing 3D characters to life by creating movements and expressions that communicate emotions, actions, and narratives. This process is central to storytelling in film, video games, and other digital media. Character animation combines technical expertise and artistic creativity, requiring animators to simulate realistic body movements and facial expressions that align with the personality and role of the character (Beane, 2019).

One of the fundamental steps in character animation is rigging, which involves building a skeletal framework or digital "bones" for the character. This rigging process enables animators to manipulate the character's movements using controls or keyframes. Autodesk Maya provides advanced rigging tools, including IK (inverse kinematics) and FK (forward kinematics) systems, which allow for precise control over limb movements and joint articulation (Derakhshani, 2016). Another critical aspect is facial animation, which brings characters' emotions to life through expressions, lip-syncing, and subtle movements like eyebrow raises or smirks. Blend shapes and joint-based systems are widely used techniques in Maya to create detailed and believable facial animations. These methods enable animators to blend multiple facial expressions seamlessly, ensuring fluid and natural transitions (Autodesk, 2021). Performance capture, or motion capture, has revolutionized character animation by recording live actors' movements and transferring them to digital characters. This technology allows for the creation of highly realistic animations by capturing intricate details of human motion, from walking to nuanced hand gestures. Maya integrates well with motion-

capture software, making it a preferred choice for animators in the film and gaming industries (Gould, 2005).

The final stage involves refining the animation using principles like timing, anticipation, and follow-through, which ensure the movements appear lifelike and engaging. For instance, animators often exaggerate specific actions to emphasize emotions or actions, a principle known as "squash and stretch." Maya's Graph Editor aids in fine-tuning these animations by allowing animators to adjust curves and transitions, ensuring smooth and polished results (Beane, 2019).

Character animation is pivotal in connecting audiences with stories by creating relatable and expressive characters. Whether in a blockbuster movie or an indie video game, character animation enhances immersion and adds depth to the narrative, demonstrating its significance in visual storytelling (Lee et al., 2020).

#### **2.14.5 Environment Modelling, Texturing, and Animation**

Environment modelling involves creating 3D spaces or landscapes where characters and objects exist, playing a critical role in establishing the setting and mood of a story. This process begins with conceptualization, where artists design layouts, objects, and overall spatial composition. Tools such as Autodesk Maya provide robust modelling features, including polygonal and NURBS modelling, which enable artists to craft intricate and realistic environments, from urban cityscapes to fantastical worlds (Derakhshani, 2016). Texturing is the next essential step in environment creation, where surfaces are given colour, patterns, and details to enhance realism. This is achieved by applying materials and textures to 3D models. Techniques such as UV mapping are employed to wrap textures around complex shapes accurately. Software like Maya and Substance Painter often work together to create highly detailed and

photorealistic textures. Textures may include elements like rust, water reflections, or wood grain, which add depth and authenticity to the environment (Autodesk, 2021).

Environment animation involves adding dynamic elements to these modelled spaces, such as moving water, swaying trees, or shifting clouds. Animators use tools like Maya's simulation engines to create realistic physics-based animations. For example, particle systems can generate effects like fire, smoke, or rain, while fluid simulations can model the flow of rivers or ocean waves. Additionally, lighting and camera animations are used to guide viewers through the environment and enhance storytelling (Beane, 2019). The integration of environment modelling, texturing, and animation is particularly vital in immersive experiences such as virtual reality (VR) and gaming. In these contexts, environments must be interactive and responsive, providing users with an engaging and seamless experience. Techniques like real-time rendering with game engines such as Unreal Engine or Unity are commonly used in tandem with Maya to achieve this goal (Gould, 2005). Creating detailed and animated environments elevates the visual storytelling experience, immersing the audience in believable and captivating worlds. This comprehensive approach is indispensable for productions that aim to transport viewers into richly crafted, dynamic settings (Lee et al., 2020).

### **2.15 Using Autodesk Maya for Visual Communication and Storytelling**

Autodesk Maya serves as a powerful tool for visual communication and storytelling, offering creators an extensive array of features to bring narratives to life. The software excels in creating visually compelling animations, integrating character performances, and building immersive environments, which are essential components of effective storytelling. Its advanced modelling tools and animation workflows allow

creators to shape intricate 3D worlds that resonate emotionally with audiences (Derakhshani, 2016).

Maya's flexibility makes it invaluable for producing dynamic and expressive character animations. Through features like character rigging and motion capture integration, animators can create realistic movements and facial expressions, enhancing the narrative's emotional depth. Its simulation tools, such as particle and fluid effects, add realism to scenes, whether depicting dramatic explosions or serene water ripples, thus strengthening the storytelling experience (Beane, 2019). The software's role in visual communication extends beyond entertainment, as it is widely used for educational and promotional projects. For instance, complex scientific processes, historical events, or health campaigns can be communicated effectively using 3D animations crafted in Maya. Its ability to simplify intricate concepts into engaging visual formats ensures the message reaches diverse audiences with clarity and impact (Gould, 2005).

Maya's integration with other software, such as Adobe After Effects for compositing and Premiere Pro for editing, streamlines the postproduction process, enabling creators to refine their visual narratives. The use of advanced rendering engines like Arnold ensures that the final output is of the highest visual quality, making it suitable for cinematic, advertising, and instructional purposes (Autodesk, 2021). Additionally, Maya's node-based architecture offers flexibility for procedural animations, allowing storytellers to experiment and iterate on visual elements without compromising workflow efficiency. This capability is particularly useful in creating adaptive content for various media platforms, including augmented reality (AR) and virtual reality (VR), where immersive storytelling is key (Lee et al., 2020).

In sum, Autodesk Maya empowers visual communicators and storytellers to craft compelling narratives that transcend traditional mediums, engaging audiences through stunning visuals and well-articulated messages. Its versatility and robust feature set make it a cornerstone tool for professionals aiming to communicate ideas creatively and effectively.

### **2.16 Using Autodesk Maya 3D Software for 3D Animation on Malaria**

Autodesk Maya is one of the most advanced and versatile 3D animation software tools used in the creation of realistic animations, making it a suitable choice for producing educational content about Malaria. Known for its robust capabilities in modelling, texturing, rigging, and rendering, Maya enables animators to create detailed and lifelike depictions of medical processes, such as the transmission and treatment of Malaria, for public awareness campaigns.

Maya's high-level modelling tools allow for the creation of accurate visualizations of the Plasmodium parasite and Anopheles mosquito, essential elements in explaining Malaria's transmission cycle. By incorporating realistic textures and motion, animators can simulate how mosquitoes bite and introduce the parasite into the human bloodstream. Such animations enhance public understanding of the disease's life cycle, making abstract scientific concepts more accessible and engaging (Autodesk, 2020). In addition to modelling, Maya's animation features provide precise control over movement, which is crucial for medical storytelling. For example, animators can depict the journey of Malaria parasites through the bloodstream to the liver, where they multiply, and back into the blood to infect red blood cells. These detailed visualizations

are instrumental in demonstrating the biological processes involved, which are often difficult to convey using traditional media.

Autodesk Maya also offers advanced rendering capabilities, such as Arnold Renderer, which can produce high-quality visuals suitable for public health campaigns across multiple platforms. These rendered animations can be integrated into videos, virtual reality experiences, or interactive educational tools, ensuring that the content is engaging for audiences with diverse learning preferences (Autodesk, 2021).

For educational institutions and health organizations, Maya supports collaboration by allowing multiple animators and designers to work on a project simultaneously. This capability is particularly beneficial for large-scale campaigns on Malaria, where teams need to develop cohesive and high-quality animations under tight deadlines (Autodesk, 2021). Moreover, the software supports compatibility with other tools like Adobe After Effects and Unity, enabling seamless integration of animated content into broader multimedia campaigns. This interoperability allows for the creation of dynamic public service announcements, interactive infographics, and virtual training simulations tailored to various audiences (Autodesk, 2021).

Using Maya for Malaria-related animations not only supports mass communication but also enhances advocacy and educational efforts. For example, health organizations can use animations to train healthcare workers on diagnosing and treating Malaria. Similarly, governments and NGOs can incorporate these visuals into community outreach programs to encourage preventive behaviours such as using insecticide-treated bed nets and eliminating mosquito breeding sites (WHO, 2019).

In conclusion, Autodesk Maya is a powerful tool for developing 3D animations that communicate the complexities of Malaria in an engaging and educational way. Its

robust features, flexibility, and ability to produce high-quality visuals make it an essential resource for public health campaigns aimed at combating Malaria.

### **2.17 Adobe After Effects and Adobe Premiere Pro to 3D Animation and Their Importance in the Postproduction Process**

The integration of software like Adobe After Effects and Adobe Premiere Pro into the 3D animation workflow significantly enhances the postproduction process, allowing animators to refine and elevate the quality of their projects. These tools complement 3D animation software by providing advanced editing, compositing, and visual effects capabilities that are essential for creating polished and impactful animations.

After Effects excels in compositing and visual effects, enabling animators to merge 3D-rendered footage with other elements, such as motion graphics, text overlays, or visual enhancements. For instance, After Effects can add atmospheric effects like lighting, shadows, or particle systems to a 3D animated scene, making it more immersive and realistic. This is particularly useful in public health animations, where elements like flowing data visuals or animated infographics can effectively reinforce the message being conveyed (Adobe, 2020).

Premiere Pro plays a critical role in the editing phase, where raw 3D animations are assembled into cohesive narratives. This software allows animators to trim, sequence, and synchronize 3D animation footage with audio tracks, voiceovers, and background music. Its advanced timeline editing and sound design features enable the seamless blending of all elements, ensuring that the final output maintains a professional standard. For example, a Malaria awareness animation might require

synchronization of visuals depicting the life cycle of the Plasmodium parasite with an explanatory voiceover and accompanying sound effects (Jones & Walker, 2018).

Both software programs are designed to streamline workflows and improve efficiency in postproduction. They offer a wide range of plugins and presets that simplify complex tasks, saving time without compromising quality. Animators can also use the dynamic link feature between Adobe After Effects and Adobe Premiere Pro to work on the same project simultaneously across both platforms, eliminating the need to render files repeatedly (Adobe, 2022). Additionally, these tools provide essential features for optimizing animations for different platforms and audiences. For instance, Premiere Pro offers robust export settings that ensure animations are encoded in the appropriate formats for online streaming, television broadcasting, or social media sharing. After Effects, on the other hand, supports the creation of platform-specific assets such as GIFs or short looping videos, enhancing the accessibility and reach of the content (Jago, 2022; Meyer & Meyer, 2019).

In the context of 3D animations for Malaria communication, using After Effects and Premiere Pro ensures that the final product is not only visually compelling but also well-organized and impactful. These tools allow for the incorporation of compelling narratives, clear messaging, and engaging visuals, all of which are critical in educating and persuading audiences about the importance of Malaria prevention and treatment.

## **2.18 Health Education and Malaria**

Sokeh and Adisah-Atta in 2017 conducted a study that looked at the challenges confronting rural dwellers in accessing health information in the Shai Osudoku District. Their study investigated health information seeking behaviours as well as the barriers

to health information seeking among rural dwellers in the district. The study employed convenient and purposive sampling technique with a sample of 210 community members. The study was quantitative and Statistical Package for Social Sciences (SPSS) version 21.0 was used to process the data. The data was processed into statistical tables and charts for interpretation and discussion.

The outcome of the study revealed that the most common sources of health information seeking among rural community members in the district of investigation are posters, health care providers and families/friends, with radio being the most used platform. It was also revealed that those respondents with higher level of education are more likely to use the Internet and television in accessing health information ( $p = 0.001$  and  $0.000$  respectively). Similarly, respondents with primary education or informal education were more likely to contact family members for health information ( $p = 0.001$ ).

The outcome of the study also shows that many rural communities in Ghana, particularly rural dwellers of Shai Osudoku District, face numerous challenges in accessing health information. Notable among them are language barrier, location of the villages and inaccessibility to emerging technologies such as mobile phones and television sets. The study concluded that, policies for improving health information access and reducing barriers to health information seeking in rural communities should be designed and implemented by Ghana health service. Also, education on how to access health-related information with easily accessible sources either free or at low-priced could be a way to help people in rural settings in Ghana with limited health information.

Boateng et al. (2021) studied co-creation and prototyping of an intervention focusing on health literacy in management of Malaria at community-level in Ghana. The study used board game and brochure for health education on Malaria.

## 2.19 Summary

This chapter has outlined the theoretical framework underpinning a dissertation study, primarily focusing on the AIDA model and the Cognitive Theory of Multimedia Learning (CTML). The frameworks aim to provide a guide for the study's philosophical, epistemological, methodological, and analytical approach.

- **AIDA Model:** The AIDA model (Attention, Interest, Desire, Action), originating from St. Elmo Lewis, is presented as a marketing and advertising tool for understanding consumer engagement. It posits that effective advertising captures attention, sustains interest, creates desire, and prompts action. The study intends to use AIDA to structure the storyline of an animation designed to raise awareness and promote behaviours to reduce Malaria spread in rural communities.
- **Cognitive Theory of Multimedia Learning (CTML):** Developed by Richard E. Mayer, CTML suggests that people learn more effectively through multimedia (words and pictures) than through words alone. The theory is grounded in cognitive science principles like dual-channels, limited capacity, and active processing. It also incorporates Atkinson and Shiffrin's Multi-Store Model of memory (Sensory Register, Short-Term Memory, Long-Term Memory) and Sweller's Cognitive Load Theory. The study will use CTML to inform the design of the animation, considering how the human memory receives and processes information.

In essence, the theoretical framework argues that by integrating the persuasive principles of the AIDA model with the cognitive learning principles of CTML, the study can create impactful animations for educational and behavioral change purposes, specifically in the context of Malaria prevention.

Art-based research as a qualitative research design, emphasizing its capacity to provide unique insights beyond traditional methods. It highlights a literature review that identifies the benefits of art-based methods in health research, including enhanced data creation and improved communication, while also pointing out the need for critical evaluation and ethical considerations. The excerpt further examines visual communication, focusing on its ability to transcend language barriers, enhance understanding, and engage diverse audiences. It notes how visual elements, simplified storytelling, graphics, and illustrations can aid in clearer comprehension, making visual communication highly effective in health education contexts, such as Malaria awareness campaigns. Recent technological advancements like 3D animation are discussed, highlighting their potential to enhance audience engagement and message delivery.

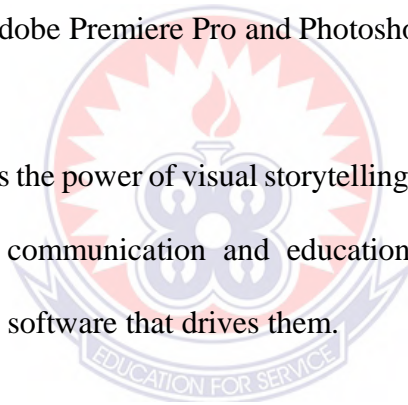
Additionally, it touches on the essential role of communication modes and channels, differentiating between written, non-verbal, and verbal communication. It also considers how aspects like the choice of channel (rich vs. lean, formal vs. informal) and target audience influence communication effectiveness. Finally, the text emphasizes the role of language in communication and advertising, referencing studies that examine how language shapes reality and influences consumer behavior. It also discusses the potential impact of using native versus foreign languages in advertisements.

The chapter also discusses visual storytelling and animation, highlighting their effectiveness in communication, particularly in public health campaigns.

- **Visual Storytelling:** Visual storytelling, using images and sequences, effectively engages audiences by evoking emotions and fostering understanding through relatable visuals. It simplifies complex information, enhances message recall, and is particularly effective in public health for translating data into relatable narratives. Recent advancements in 3D animation have further broadened visual storytelling's potential.
- **Animation:** Animation is presented as a dynamic medium for simplifying complex ideas and promoting learning. In public health, animation effectively illustrates medical processes, health risks, and preventative measures, improving comprehension and recall. 3D animation enhances engagement with realistic, interactive content.
- **History and Evolution of Animation:** The history of animation traces back to early attempts at depicting motion, evolving through inventions like the zoetrope to modern digital techniques. Key milestones include Disney's introduction of synchronized sound and Pixar's *Toy Story*, which showcased the potential of digital animation. Software advancements have made animation more accessible across various fields.
- **Types of Animation:** The text outlines different types of animation, including traditional (hand-drawn), stop-motion, 2D digital, 3D, and motion graphics, each with unique methods and applications. 3D animation, in particular, is noted for its realism and use in fields like healthcare and engineering, while 2D animation is favored for its clarity and quick information delivery.

- **Animation Software:** The evolution of animation software has transformed the industry, from manual techniques to digital methods. Key programs include Autodesk's AutoCAD and Maya, Adobe After Effects and Animate, Blender, and Toon Boom Harmony. Real-time rendering engines like Unreal Engine and Unity are also transforming animation for interactive applications.
- **Research in 2D and 3D Animation:** The researcher reviewed literature focusing on 2D and 3D animation, referencing specific studies that produced 2D animation advertisements. It also notes that 2D and 3D animation can be combined for aesthetic impact and convenience. This current study adopts data gathering methods and production steps from previous research, utilizing software like Adobe Premiere Pro and Photoshop.

The section underscores the power of visual storytelling and animation, particularly 3D, as tools for effective communication and education, highlighting their evolution, different types, and the software that drives them.



## CHAPTER THREE

### METHODOLOGY

#### 3.0 Overview

This chapter discusses the Philosophical Assumptions of the study, Research Approach and Design, Sample and Sampling Techniques, Data Collection Instruments, Data Collection procedure, ethical and trustworthiness considerations and methods of Data Analysis.

#### 3.1 Philosophical Assumptions of the Research

Philosophy of research is the overarching term linked to the "development of knowledge and the nature of that knowledge" (Saunders et al. 2009, p.101). A philosophical positioning is conceptualized as a "worldview that underlines and informs methodology and methods" (Corbin & Strauss, 2008, p. 1). The choice of research methodology and methods is underpinned by the contrasting collection of beliefs regarding social reality and knowledge. Different scholars use varying terms to refer to the fundamental set of beliefs that guide a methodology. Lincoln and Guba (2000) refer to these beliefs as 'paradigms', Cresswell (2009) on the other hand conceptualizes them as 'worldview' whilst Silverman (2010) uses the term 'models'. Scholars such as (Hussey & Hussey, 1997) have noted that some researchers use the terms 'methodology' and 'method' interchangeably. However, others have given a distinction between the two concepts. Pryor (2010), for instance, argues that methodology encompasses the totality of the research design which involves both theoretical and practical considerations whereas method is specific techniques used to produce data in a manner compatible with the methodology. Hussey and Hussey (1997) support that methodology refers to the overall approach chosen in the conduct of a study

which entails the theoretical basis from which the researcher is affiliated whilst method is the various means by which data is collected and analyzed.

Analysing the views of Pryor and Hussey and Hussey, it could be observed that a connection exists between methodology and method, and that the adoption of a particular methodology determines the choice of method to adopt for a study. This claim supports the perspective of Morse et al. (2002) that different methodological approaches are underpinned by particular philosophical assumptions and that researchers should maintain consistency between their philosophical standpoints and the methods they adopt to ensure validity of results. Thus, each methodology is founded on a philosophical position of research in general and a study in particular. In line with this reasoning, Speziale and Carpenter (2007) profess that it is crucial for researchers to understand the philosophical underpinning of each methodology. This knowledge affords insights into what factors to consider when deciding upon the best methodology to answer a research question.

Researchers like Tight et al. (2006) contend that there are philosophical decisions underpinning research which formulate how social reality is to be observed, understood and represented. A researcher's understanding of the world, the ontology, the epistemology, and perspective on how knowledge is acquired directs them to undertake particular research in accordance with their preferred philosophy (Cameron & Price, 2009). Therefore, it is suggested that the choice of research strategy and data collection and analysis techniques should be informed by first considering the preferred philosophy and approach (Saunders et al., 2009). As a result, the philosophical stance of the researcher and the methodology to be adopted must run parallel so as to produce trustworthy results.

Ontology makes assumptions about the nature of social reality, what there is to know about the world and its relationship with humans. Ontological debates concern whether or not there is a social reality that exists independently of human conceptions and interpretations. Based on this argument, Bryman (2008) identifies two ontological positions: objectivism and constructionism. According to Bryman, ontological objectivism conceptualizes social reality as external and independent of the researched, and therefore it can be accessed through natural scientific approaches as in physics, chemistry and biology that are objective in nature. Accordingly, the social phenomena that form the basis of research are beyond the influence of the social actors. It operates on the assumption that human behaviour is essentially rule-governed (Cohen, Manion, & Morrison, 2017). Consequently, the researcher is seen as a 'distant observer' of social reality usually with the use of measuring instruments like the questionnaire to gather data for statistical analysis and inferences.

Bryman (2008) contends that constructionism considers social reality as socially created, subjective experiences and the result of human thought as expressed through language. It views the subject of inquiry as the product of the interrelationships between the social players that is in constant modification over time. To access social reality therefore requires the researcher to become active participant in the lived experiences of the researched. With constructivism, knowledge is constructed from human experience. This perspective is based on inseparability between knowledge and knower. The researcher observed the study area.

Epistemology is the theory of knowledge and is concerned with how we know. It denotes what is regarded as appropriate knowledge about the social world and what may be regarded as the appropriate methods of inquiry to acquire knowledge (Cohen, Manion & Morrison, 2017). Bryman advances two epistemological assumptions of

research: positivism and interpretivism. He argues that positivist stance perceives knowledge as the gathering of facts through the application of the methods and procedures of the natural sciences. The positivist approach applies principles of phenomenism and knowledge is acquired through the collection of facts in a value free manner (Bryman & Bell, 2011). It works on the basis that credible data can only be based on phenomena that can be observed. Travers (2001) contends that a central tenet of positivism is that researchers can take a 'scientific' perspective when observing social behaviour with an objective analysis possible.

Interpretivism, on the other hand, is centered on the claim that authentic knowledge is derived from the interpretation of human behaviour based on the perspective of the social actors. Cohen et al. (2000) further argue that the interpretivist conceptualizes reality as a complex social construction of meanings, values and lived experiences which results in the production of knowledge through a social construction of the world. The underlying tenet of interpretivism is the conviction that researchers cannot avoid affecting the phenomena they investigate. Interpretivists therefore contend that only through the subjective interpretation of that reality be fully understood. The study of phenomena in their natural environment is essential to the interpretivist philosophy.

Though theoretically diverse, ontological and epistemological viewpoints converge in the choice of methodological approach in a study. Crotty (2003) posits that ontology and epistemology are concepts that are intricately intertwined and difficult to keep apart. Objectivist ontology and the positivist epistemology fall within the quantitative approach whilst the constructionist ontology and interpretivist epistemology are located in the qualitative domain of research.

Based on the preceding discussions and the purpose of the study, the researcher chose the interpretivist epistemology viewpoint of research. This can be better understood based on the interpretations of the researched, and the engagement of the researcher and the researched in a natural setting. This decision is consistent with the argument of Mander (2010:252) that “impersonal ‘objective’ social science research is inadequate to investigate complex social phenomena”. Besides, Creswell (2013) posits that data-gathering techniques in the interpretivist assumption include observation, interviews, documents and audio-visual materials that produce data typically in words. The methods used to produce data included observation, interviews, and documents which are mostly used by the interpretivists. The researcher employed interviews, observation and visual research in collecting the data for the study.

### **3.2 Research Approach**

Creswell (2014) defines research approaches as procedures and the plans for research that span the steps from comprehensive assumptions to detailed methods of data collection, analysis, and interpretation. This means that a research approach is the procedure selected by a researcher to collect, analyse, and interpret data collected for a study. According to Creswell (2014), there are three approaches to research. They are qualitative research, quantitative research and mixed methods research. This study employed qualitative as its research approach.

Qualitative research, according to Denzin and Lincoln (2007), is defined as a situated activity that discovers the observer in the world. On the other hand, Creswell (2014) also defines qualitative research as an approach for exploring and understanding the meaning people ascribe to a human or social phenomenon. It involves an interpretive, naturalistic approach to the world. This means that qualitative researchers

study a phenomenon in their natural settings, attempt to make sense of, or interpret the particular phenomena in terms of the meanings people bring to them. The authors add that qualitative research comprises the planned use and collection of a variety of empirical materials such as case study; personal experience; introspection; life story; interview; artefacts; cultural texts and productions; interactional, historical, observational, and visual texts that explain the routine and difficult moments and meanings in people's lives.

Unlike the quantitative methods which use numerical measurement, statistical analysis and empirical calculation, in qualitative research, the researcher describes and interprets issues or phenomena systematically from the individual or population the researcher is investigating to generate new concepts and theories. Qualitative research method enhances the understanding of a cultural, social, economic, political and institutional context within which development interventions occur (Bamberger, 2000). The researcher selected qualitative research method for this study because the study explored the views of the participants in the community with respect to receiving information on Malaria and also collecting notes from the field. These details retrieved from the community were used in the creation of an animation as developmental intervention tool to help prevent and reduce the spread of Malaria in the study area.

### **3.3 Research Design**

A research study must be guided by a design. A design of a research study refers to the type of inquiry within a specific research approach that gives a specific direction the procedures to be used to execute research. There are several types of designs for qualitative inquires. Several researchers have often used some of the usual or traditional

types of qualitative research designs such as phenomenology, ethnography, case study, content analysis, grounded theory and others for their studies.

Arts-Based research is also one of the types of qualitative research designs. Researchers such as Coemans and Hannes (2017) and Knowles and Cole (2008) state that Arts-Based research methods are often situated within the qualitative research tradition. Kara (2015) on another hand also avers that there are very creative works done using quantitative methodologies.

The term Arts-Based research was officially launched by Barone and Eisner in the year 1993 (Barone & Eisner, 2012). According to these authors, the Arts-Based form of research is in a sense a species of qualitative research. Wilson and Flicker (2014) posit that Arts-Based action research is a blanket term that refers to the use of the arts, in various forms, as the basis for inquiry, intervention, knowledge production and/or information sharing. They further argue that as a research method, Arts-Based approaches consist of the merging of the conventions of 'traditional' qualitative methodology with those of the arts to allow for deeper research insight, interpretation, meaning making and creative expression, and alternative knowledge and ways of knowing (Wilson & Flicker. 2014). Desyllas (2014) argues that Arts-Based research has the ability to transform and empower, and has the potential to create social change through creativity. Coemans and Hannes (2017) note that, thanks to their participatory nature and openness to different ways of understanding, the use of Arts-Based methods in community-based settings can seem a natural fit. Arts-Based research methods actively engage people's senses and can place "embodied experience" centrally in the process of knowledge creation (Eisner, 2008; Kelemen & Hamilton, 2015). Lawrence (2008) also observe that the arts can provoke strong, affective responses in both the creator and the viewer of art that, subsequently, can provide a catalyst for learning

beyond traditional, and dominant, cognitive ways of knowing. In this regard, Eisner (2008) note that involving the arts in research can "promote a form of understanding that is derived or evoked through empathic experience" and provide deep insights into what others are experiencing.

Arts-Based research is also often and variedly used for studies related to health. Studies related to health have coined the term Arts-Based Health Research (Boydell et al., 2012). This is very interesting because it relates to studies in that sector. The use of Arts-Based health research has become a new way to explore social issues and an effective method for qualitative research innovation (Boydell & Jackson, 2010). The increasing use of Arts-Based methods to create and share knowledge is causing a significant change in how we define evidence and how we value the intricate and multi-faceted process of knowledge creation.

Art-based research as a design have been recognized by social scientists, artists, and healthcare practitioners as a valuable tool to explore the human aspects of health and illness. According to Keen and Todres (2007), the arts offer a unique way to produce and communicate research findings and best practices in healthcare. Jones (2006) also points out that incorporating art forms in the research process can evoke emotional responses and construct alternative forms of representation that promote dialogue and shared storytelling. The use of artistic formats enriches the research process and makes knowledge more accessible to diverse stakeholders, as noted by Colantonio et al. (2008). Gergen and Gergen (2010) further argue that Arts-Based dissemination strategies are effective in creating interest and action around social issues that require change. They note that traditional written forms of social science communication have limitations in this regard. By directing critical dialogue towards these issues, Arts-Based methods have the potential to drive meaningful change.

The design was organised in three (3) phases. They are pre-studio research, studio research and post-studio research. The pre-studio research phase conducted research on current issues on how information on Malaria prevention is disseminated in the community and also to ascertain the mass media aids used in conveying such information or messages. The main aim was to acquire knowledge on the causes and preventive measures of Malaria, to know the languages used in disseminating information on Malaria prevention and to have in-depth understanding on the mass media aids used for the awareness on Malaria. These were important to justify the need for the use of the animation for this study and also to guide the researcher in the production of the animation to help provide information on Malaria to enhance the awareness on the prevention of Malaria within the study area.

At the studio research phase, the researcher included the use of field study, studio practices and design methods to collect additional data for the development of ideas, generate concepts, design content, write script, storyboards, characterization, voice recording and other relevant ideas to get the study going. Subsequently, the researcher used a draft version of the final animation to conduct pre-test research using the selected sample to refine the content and structure of the animation. The draft version that was used for pretesting helped the researcher to subject the content, concept, narrative, and other communication elements to review and to incorporate the responses into the main production of the animation (See the extensive description of the pre-production, production and post-production processes and techniques in the next chapter).

The post-studio research involved fieldwork (showcasing the finished animation) which examined how the content and design strategies used for the production of the animation shaped the experiences of the samples on Malaria health

education and how the communication and persuasive elements in the animation shaped the responses and interpretations of the samples. With the adoption of this approach, the researcher was able to investigate the current case in depth and draw an academic conclusion regarding the usage of animation for improved health education on Malaria in Effutu in the Central Region of Ghana and the entire country as a whole.

For this study, the researcher chose to use Art-Based Research as the design. The study integrated the traditional research techniques with the animation production method of inquiry to represent human action and to evaluate its efficacy (Kara, 2015). The art-based research design is widely acknowledged as a legitimate qualitative methodology by which researchers can enhance understanding of artistic and design activities and the effects of such designs on their samples (Batty & Kerrigan, 2018). This type of design is particularly effective because it allows for emotional responses and alternative forms of representation, which promotes dialogue and shared storytelling. In doing so, the animation became an effective tool to deliver knowledge and information on Malaria to a diverse group of stakeholders as evidenced in the findings.

### **3.4 Location of the study**

The study was conducted in Effutu Municipal District in Central Region of Ghana. The district is one of the 22 district assemblies in the Central Region of Ghana. The municipality is about 64 square kilometres in land size. It stretches to the East by Gomoa East, to the West by Gomoa West, North by Gomoa East and to the South by Gulf of Guinea. The municipality has a population of 112,703 currently. The municipality has twenty-seven (27) functioning health facilities spread across the communities. These are Essuekyir CHPS, Gyangyanadze CHPS, Gyahadzi CHPS, Dr.

Kwame Prah CHPS, Osubonpanyi CHPS, Hon. Ephraim CHPS, Ansaful CHPS, Klimovic Memorial Hospital, New Winneba CHPS, Trauma & Specialist Hospital, University Clinic, Gyatekrom CHPS, Ayigya Lodge CHPS, New Low Cost CHPS, Coast for Christ Hospital, Papa-Kow Demtse CHPS, Winneba Municipal Hospital, Zongo CHPS, George Kwame Quansah Health Centre, Hon. Samuel Owusu Agyei Health Centre-Dayasaw, Winneba, Winneba Local Prison Clinic, Water Works CHPS, Bethel Maternity Home, Otoo Memorial Hospital, Winneba Health Centre, Penkye CHPS and Akosua Village CHPS. The government of Ghana owns 22 of these health facilities and 5 of them are owned by private individuals or organisations (Effutu Municipal Health Directorate, 2023).

The study area was traditionally known as *Simpa*. *Simpa* is a historic fishing port in south Ghana. The area is also known for its famous masquerade festival, popularly known as Winneba Fancy Dress, and the Aboakyer Festival. These festivals are held every New Year Day and the first week in May of every year respectively, among the people of Winneba.

Winneba has a number of neighborhoods stretching from the coastal areas to non-coastal areas. It also includes rural areas which provide farm power aside the fishing activity employed by the inhabitants of the coasts. Some of the well-known neighborhoods within the municipality are as follows; Winneba Junction, New Winneba, Ansaful, Ntakorfam, Lowcost, Yepemso, Nkwantanan, Kundum, Abasraba, Girls-Ase, Kojo-Beedu, Gyatakrom, Central Campus, North Campus, South Campus, Akosua Village, Zongo, Sankor, Water-works, Essuekyir, Woarabeba, Penkye, Gyaahadze, Osubonpanyin, Ateitu, Atakyedo, Gyangyanadze, Kookrom etc.

### 3.4.1 Map of the study area

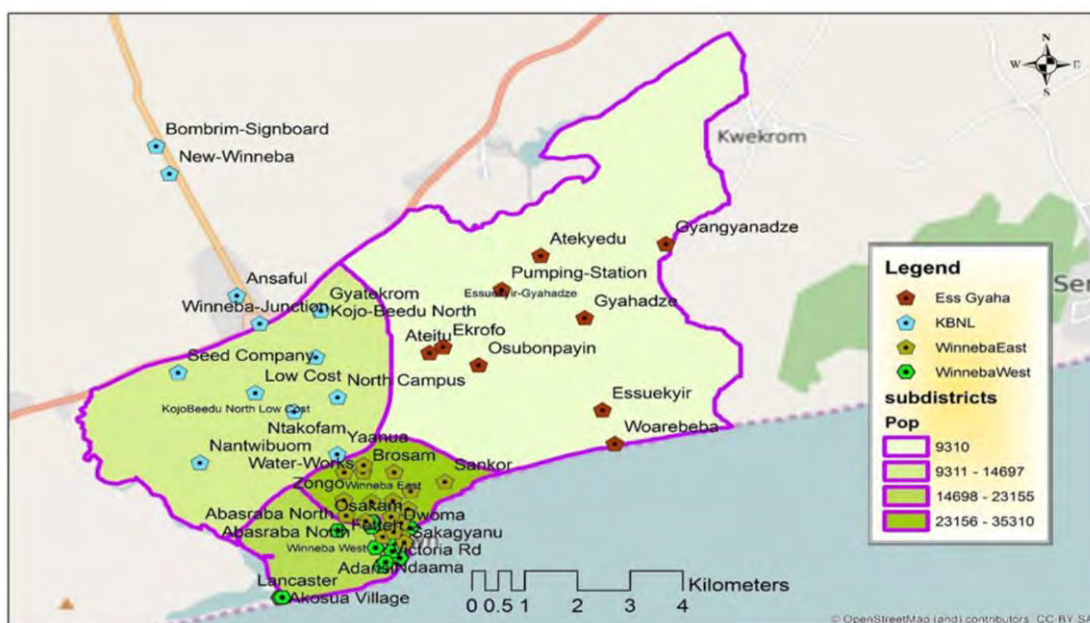


Figure 5. Map of the study area.

Source: (Effutu Municipal Health Directorate, 2023).

**Table 1:** Number of health facilities contacted for the study

Name of Health Facility	Facility Status
Winneba Municipal Hospital	Hospital
Trauma & Specialist Hospital	Hospital
Total Number of health facilities	2

Source: Researcher’s fieldwork, 2024

### 3.5 Basis for the selection of study locations

The researcher’s choice for the study area was based on certain reasons. Firstly, the area has a mixture of urban and rural settlements. Same applies to the health facilities. There are several health facilities situated both in the urban and rural areas within the study area. All the selected health facilities are patronised by community members residing in both the urban and rural areas within the municipality. This helped the researcher to collect varied opinions from all levels of health facilities regarding the

use of animation for health education on Malaria. Secondly, the municipality is in the Central Region of Ghana which recorded over 10 percent Malaria prevalence per the Ghana Demographic and Health Survey (DHS) 2022 statistics. The Central Region of Ghana formed the focus of the study due to its standings as one of the poorest regions in Ghana (GSS, 2010). Also, findings from the Ghana Demographic and Health Survey (DHS) 2022 indicate that Malaria prevalence in rural areas is 12.8%. This is about three times that of urban areas which stands at 4.3% (Ghana Statistical Service, 2023).

Per the above statistics, Greater Accra (2.0%) recorded the lowest prevalence followed by Western North (4.4%) and Volta (6.4%). The regions with the highest prevalence of Malaria according to microscopy results are Oti (15.0%), Upper West (13.4%), and the Upper East (12.2%) regions. In all, half of the 16 regions record Malaria prevalence above 10 percent which include *the Central Region*. The researcher chose the study area because of proximity since the researcher is located in the Winneba, Central Region. Table 1 gives a breakdown of the selected health facilities.

### **3.6 Population of the study**

The population consisted of all health facilities within the municipality. Secondly, all health officers who work in the health facilities within the municipality, and lastly, all community members (patients) who attend the health facilities for health care in the Effutu Municipality in the Central Region of Ghana, are part of the population. Animation professionals in Ghana also form part of the population.

#### **3.6.1 Target Population**

Target population refers to a subset of the broader population being investigated, which is characterised by specific attributes directly relevant to the

research study (Alvi, 2016). This subset is defined based on parameters that align with the objectives and scope of the research study, allowing researchers to focus their investigations on segments of the population that are of particular interest and/or significance (Asiamah et al., 2017; Casteel & Bridier, 2021; Willie, 2022). The target population is the group of participants the research is designed to inform or use for a particular study. The target population of this study were all health officers in the two (2) health facilities selected for the study, and all the community members in resident around the study areas in the Effutu Municipality of the Central Region of Ghana.

### **3.6.2 Accessible Population**

Bartlett et al. (2001) state that the accessible population of a study is reached after taking out all the participants of the target population who will or may not participate or who cannot be accessed at the study period. It is the final group of participants from which the study data is collected by surveying either all its members or a sample drawn from it. The above inference suggest that accessible population is the actual sample of participants that would be used for the study. The accessible population of this study is stated in item 3.7 (Sample and Sampling Technique).

### **3.7 Sample and Sampling Technique**

Most academic research classifies the technique/s employed to select samples for research work. Sampling is one of the most important factors which determine the accuracy of a study (Bhardwaj, 2019). A sample in research refers to a smaller or controllable version of a population. Etikan and Babtope (2019), state that a sample size is a representation of the population utilised by the researcher and from whom inferences are made. Maxwell (2012) says that in qualitative studies, smaller sample

sizes are used than in quantitative studies. This is due to the fact that qualitative research creates a large amount of detailed data which is used to comprehend the experiences of a study's participant. A sample is selected, provided the population is not large for a study. Lakens (2022) argues that for a qualitative study, a sample size of between six (6) and ten (10) could be used. In another vein, Etikan and Babtope (2019) aver that a sample size for qualitative studies can be between five (5) and twenty-five (25) participants. For qualitative studies, smaller sample sizes are often acceptable, with recommendations ranging from 5 to 30 participants, depending on the research method and depth of inquiry (Guest, Bunce & Johnson (2006); Creswell (2013). In light of the above discussion, the researcher used a sample size of twenty-two (22) participants for the study.

In selecting a sample for a study, there should be a technique to be employed. Van Haute (2021) avers that research sampling techniques refer to a case selection strategy which looks at the processes and methods used to select a subset of units (sample) from a population.

This study adopted the non-probability sampling technique to select the samples for the research. With non-probability sampling technique, the researcher does the selection of samples based subjective judgement. In this case, not everyone in the population has a chance to be selected for the study.

The study employed purposive and convenience sampling techniques to sample twenty (20) participants out of the population and two (2) health facilities for the research. Bhardwaj (2019) defines purposive sampling as a technique where respondents or participants of a study are selected due to the purpose of the phenomenon being study. Bhardwaj further refers to purposive sample as deliberate or

judgmental sampling. Obilor (2023) also supports Bhardwaj's position that purposive sampling is also known as judgement sampling. Obilor connotes that purposive sampling is subjective because it is subject to the researcher's judgment and knowledge in the study context. Obilor further states that with purposive sampling, the researcher intends to understand a specific phenomenon in-depth rather than make statistical inferences. This method is particularly useful when the population is small and specific. To ensure a successful purposive sample, the researcher must have well-defined criteria and a clear rationale for including particular individuals. With proper implementation, purposive sampling can be used to weed out unrelated comments and responses that do not make sense for the study. Moreover, it can reduce the margin of error in data collection because the data sources are a close match to the research context, saving time that would have been spent selecting every member of the population. By collecting information from the best-fit participants, the researcher can lower the sampling error margin, which leads to highly relevant results in the research context.

Convenience sampling on the other hand is selecting respondents or participants as samples based on their convenient accessibility. A researcher does this selection because samples are easily accessible to conduct the study. Simkus (2023) connotes that individuals chosen as sample conveniently are selected not because they are most representative of the entire population, but because they are most easily accessible to the researcher. Obilor (2023) is also of the view that convenience sampling only includes subjects who happen to be easily accessible to the researcher. Using this sampling strategy, the researcher chooses study participants or respondents based on proximity; the representativeness of the group is not taken into account. Convenience and accessibility are the main factors used by researchers in convenience sampling to choose which people would comprise the research sample. This implies that the

investigator only gathers information from those who are easily identified and contacted. The only requirements for the sampling approach are that participants be willing and able to participate.

The two (2) health facilities which are highly populated by Effutu and Fanti speaking dwellers were purposively sampled for the study. These health facilities are Winneba Municipal Hospital and Trauma and Specialist Hospital which are both located in Winneba. These hospitals were selected because they are government-owned and also, they form the two (2) biggest hospitals within the municipality. They are referred to as the biggest because of infrastructure, equipment and human resource. Within these facilities, five (5) health officers were chosen purposively, summing up to ten (10) health officers. They consisted of nurses at the Public Health Departments in the respective health facilities. Again, five (5) community folks from the surrounding communities located around each health facility, so making ten (10) community folks were conveniently selected. In total, twenty (22) participants were selected as sample for the study. Two (2) participants each were selected within the premises of the two (2) health facilities, and three (3) participants each were selected from both communities (outside the health facilities).

The two (2) animation professionals were purposively sampled because of their expertise in the animation industry and their availability to guide the study. These professionals who have over ten (10) years of animation industry experience were ready to participate in the study.

### **3.8 Data Collection Instruments**

In view of the nature of research questions, three (3) instruments: Interviews, Observation and Visual research (drawings and photographs) were used in gathering

the data for the study. All the twenty (22) participants from the two (2) health facilities were engaged for the study. The researcher also studied the communities by studying the structures around and how the community folks go about with their day-to-day activities to enable the researcher know the elements peculiar to the people and needed to put together for the creation of the animations.

### **3.8.1 Interview**

Interview is a data collection tool used to gather information about another person's perspective on a phenomenon (Kvale, 1996). Cohen et al. (2013) says that the exchange of ideas or opinions between two (2) persons on a mutually interesting matter placing emphasis on the social context of research data is referred to as interview. Creswell (2014) however defines interview as the means by which researchers engage participants in conversations regarding a topic for a study. Braun and Clarke (2013) also suggest that through professional conversations with participants of a study, researchers are able to collect information with the aim of getting participants to share their perspectives on a research topic based on the questions. Interviews again are best employed by researchers when they require information which can be provided by participants as they share their views.

Peters and Halcomb (2015) indicate that interviews allow researchers to gather information that cannot be collected through observations. There are types of interviews for collecting data. Tracy (2013) mentions two types of interviews in her book. Tracy stated structured and unstructured interviews as the types of interviews used for collecting data for a study. Hawkins (2018) also asserts that to determine the preferred interview technique, the researcher must consider factors such as proximity and cost, research objectives and technology.

This study adopted structured, semi-structured and unstructured styles of interviews. The structured interviews allowed participants to answer the same questions. With structured interviews, the questions are predetermined in both topics. The semi-structured interview is a combination of elements of both structured and unstructured interviews. It involves a predetermined set of open-ended questions, but also allows for flexibility in exploring responses and emerging themes. This gave participants the freedom to respond to questions with more information

### **3.8.2 Observation**

Observation is one of the most significant varied tools employed in studies within the field of social science (Ayimbire, 2020). Observation allows the researcher to take note of people's behavior and actions in their natural setting in a sociocultural context (Hennick, Butter & Bailey, 2011). Observation can be either indirect or direct. Denscombe (2008) says that when using observation as an instrument, the researcher has the opportunity to be a first-hand witness to events at the study area. Based on the above inference, it can be said that observation as a technique for data collection involves systematically selecting, listening, touching, watching, reading, and recording the characteristics and behaviour of people, activities or phenomena for the purposes of any research study.

The observation method was employed at both the pre-studio research and post-studio research stages of the study. The researcher used the direct observation approach. During the direct approach, the research has the flexibility of reporting subtle events and can also change the focus of the observation to concentrate on unexpected happenings while still observing.

According to Wimmer and Dominick (2011) there are four categories of observation. They are overt observation, overt participation, covert observation and covert participation. For the purpose of this study, the covert observation approach was adopted to observe the study area. Even though this method of observation reduces the biases of the observer, it raises ethical concerns in the sense that covert observation appears to be a form of spying (Iedunote, 2023). In this study, the researcher observed the participants and the study area.

This observation method was also suitable because it helped the researcher to record information as it unfolds. This method gives the researcher the opportunity not to miss unanticipated phenomena that could not be captured by using other data collection techniques (Given, 2009). Data was collected using an observation checklist.

### **3.8.3 Visual Research**

Visual research methods are a collection of methods which use images as part of the process of generating data (Rose, 2015). Visual data fall into two (2) categories: visual images/materials created by others through participatory activities and studied by the researcher, and visual representations generated by the researcher (Rose, 2015). Visual data can be used to elicit discussion during interaction with respondents or participants. Visual research as a data collection method was employed to identify and collect communication material or artefacts used by health workers during educational sessions (Creswell & Poth, 2017). Visual research, therefore, is an open method of data collection which helped the study to examine existing visual communication materials on Malaria education and to gather data-rich in portraying the values, beliefs and perceptions about health officers who used visual materials to support Malaria education. (Creswell & Poth, 2017; Given, 2009).

Moore et al. (2008) connote that photography and videos are also visual types of research instruments employed to record the pre-studio data processes. The researcher also generated some images using photography to help the health officers and participants provide the necessary responses based on the research questions. Media devices like camera and smartphone were used to take photographs and videos for information gathering that provided the researcher with an insight to develop the major activities that characterise the community into idea development of sketches as a visual representation for the studio practice and post-studio data (Holm, 2014; Basil, 2011). The pre-studio data which was obtained through unstructured interview and direct and covert observation on the major characteristics of the community were collated and converted into design exploration of the idea development phase as visual designs for the studio practice.

### **3.9 Data Collection Process**

The data collection process involves the steps, ways and means by which a researcher collects data via the data collection methods for a study (Asiamah, 2017).

To answer research questions one, three and four which sought to examine how health officers communicate Malaria spread and prevention messages to the community folks and the dominant visual communication materials available for communication during Malaria health education and health workers and community folks perception about the created animation, the researcher made visits to the selected health facilities to obtain permission and established a relationship with officers. Creswell (2013) suggests that it is very important to seeking permission and negotiate access to an organization for data collection.

The researcher took an introductory letter from the Department of Music Education, School of Creative Arts, University of Education, Winneba to the various health facilities to seek their permission to conduct the study and also to enable them have access to health officers to partake in the study. The researcher also secured a permission and approval from the Effutu Municipal Health Directorate to collect data for the study. In a meeting with the Effutu Municipal Health Directorate, the researcher explained and emphasised the aims of the study to the Head of Human Resource who worked on the letter.

After gaining approval from the two health facilities, the researcher was given access to collect the necessary data from the participants by explaining and emphasising the aims of the study to all of them. The researcher then booked an appointment with all participants that were selected. The data collection procedure was done face-to-face at the selected health centres and homes of the some of the participants. The questions for the interview were unstructured guided by the conceptual framework of the study and other relevant information from the reviewed literature. The researcher conducted the interview in a relaxed mood with follow up planned and unplanned questions to clarify the main points provided by participants. Each interview session lasted between 10 minutes to 30 minutes. During the period, the researcher assured participants of confidentiality, and further used that opportunity to retrieved images of visual materials that are used for Malaria health education.

When gathering data for a study, Hennink et al. (2011) argue that interfering with regular activities of a study area can be an issue. The researcher patiently and strategically got the attention of participants without interfering in their daily activities to enable them feel comfortable enough to provide the rich data needed for the study. During the pre-studio investigations, the researcher observed first-hand information and

experience on the actual educational materials used for Malaria education, the nature of such materials, and the level of utilisation of materials, and opportunities and challenges associated with the usage of these materials.

With regards to research question two, the researcher used the primary data which was collected directly from the study area through the interviews, observation and the visual data via images of the environment in the community photographed using a camera, and secondary data that was retrieved from existing literature to come up with the ideas for the production of the animation.

During the post-studio research with health officers, the completed animation was made available to the health officers on flash drives to be watched to enable them share their views. The selected community members in and around both health facilities also watched the animation for their views as well. The researcher also used an observation checklist to collect the other part of the data.

### **3.10 Pretesting**

This study conducted two (2) different pre-tests. The first stage was done during the pre-studio and the second stage was studio to test the communicative value of storyboard and scripts of the animation, and concepts of the animation and visuals. This approach allowed animation experts, health officers and community members to examine the content and the communicative value of the animation.

### **3.11 Validation of Instruments/Piloting**

The researcher developed checklists to reflect the constructs of theories, conceptual framework and available literature for this study based on the research objectives. Copies of the instruments were made available to colleagues and animation

experts for peer-reviewing. The researcher further consulted the health officers and the participants in both communities at the study areas for their contributions. Further inputs on the instruments were sought from experienced researchers from both local and international universities. Finally, the updated instruments were submitted to the researcher's supervisor for inputs and final validation. The two (2) animation experts also validated the details of the animations, and the final rendered animation by ensuring that all their suggestions and guidelines were adhered to. The instrument was piloted using the selected participants. This activity helped the researcher to finally refine the instruments to establish reliability and adequacy for the interview. During the pilot, the researcher realised that some of the questions had to be dropped because they were generating a repetition of the responses. The final refined instrument was administered for the study.

### **3.12 Ethics and Trustworthiness of the Study**

Ethics are said to be accepted codes of conduct that bounds what is right and wrong. There are several ethical concerns in so many disciplines of human life. Ethical issues in relation to participants of a research activity are no exception. Ethics is defined as what is or not legitimate to do, or what a moral research procedure involves (Neuman, 2000). Enago Academy (2018) states that ethics are a set of principles that distinguishes between acceptable and unacceptable behaviour or way of conducting a task. Every researcher needs to anticipate some ethical concerns that may arise in the course of a study so that one can put in the effort to minimize its effect on the outcome of any data collection method (Creswell, 2014). In view of this, Creswell 2005 says that it is unethical for researchers to enter any organization or institution to gather data without permission from the gatekeepers.

For the purposes of ensuring ethical issues and trustworthiness of this study, Creswell (2013) argues that researchers must follow a well-structured processes and methods to achieve that. In adhering to ethical standards, the researcher presented the proposal for this study which detailed the description of data collection instruments, sample and measures for ensuring the safety of participants to the Department of Music Education, University of Education, Winneba for vetting, consideration and approval. The researcher further presented introductory letters from the Department of Music Education, University of Education, Winneba to the Director of Effutu Municipal Health Directorate-Winneba, Director of Health, Winneba Municipal Hospital and Director, Trauma and Specialist Hospital-Winneba all in the Central Region of Ghana. The letters outlined the purpose and significance of the study to the organisations stated earlier for permission to conduct the study and measures to protect participants. For the researcher to get the final approval from the directors, vivid description and explanation of the study was presented to them to foster understanding. A health officer in both health facilities was tasked to lead the researcher to the public health unit of the facilities to help the research go through the data collection exercise smoothly.

Ethical issues catered for in this study were right of privacy, voluntary participation, no harm of participants, anonymity and confidentiality. Voluntary participation was required of the participants and they were not to be coerced into participating in the research. In considering ethical issues in research, potential research participants must provide their consent after being fully informed about the procedures and dangers associated with the study. For this study, individual consents were obtained from participants who agreed to be engaged in the research. The participants have the rights of privacy and these rights must be respected. The rights of the participants were respected and there was no attempt to study participants without their knowledge. The

researcher made it clear to all participants that they are free to pull out from the study without restrictions and confrontations. They are assured that they are allowed to pull out of the study at any time if they so wish. All the participants were assured of confidentiality so their respective identities were not going to be revealed to any third party. They were told that all their responses were purely for research purposes. Anonymity did not suffice in this study because the identities of the participants were known to the researcher.

Trustworthiness of data findings is an important aspect of qualitative research studies. To establish trustworthiness, qualitative researchers must provide evidence of the four main requirements as proposed in Lincoln and Guba's framework for ensuring trustworthiness. Lincoln and Guba (1985) suggested four criteria for developing trustworthiness in qualitative inquiries. The framework makes mention of credibility, transferability, dependability and confirmability as what qualitative researchers must consider in ensuring trustworthiness (Shenton, 2004).

The researcher used different methods like interviews, observations and visual study with instruments that were formulated based on key themes from reviewed literature for this study to ensure credibility, transferability, and dependability. This approach allowed for triangulation of data to help cater for participants' personal differences and the researcher's extreme biases. These processes are done to confirm consistency, authenticity and correctness of the data collected. The researcher collected the data by consulting the selected participants, using appropriate visual materials and based on several visits and interaction with health facilities.

### 3.13 Method of Data Analysis

Qualitative research is a complex issue, and making sense of qualitative data is not an easy task (Coffey & Atkinson, 1996). Bogdan and Biklen (2003) define qualitative data analysis as working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned and deciding what you will tell others.

This study adopted Thematic Analysis and Textual Analysis. The data collected through interviews from the participants during pre-studio and post-studio sessions and the data on research objectives one, two, three and four were analysed thematically. The researcher tried as much as possible to conduct the interviews within the same period of time spent on each respondent even though there were a few overlaps. This approach was employed because Bennett, Glatter and Levacic (1994) argue that spending an equal amount of interview time with each interviewee ensures consistency, and it leads to trustworthiness of the study.

This study employed Braun and Clarke's (2021) five (5) steps thematic analysis approach to analyse the data collected. Braun and Clarke's approach looks at data familiarisation, coding, theme generation, review and refinement, and writing.

**1. Data Familiarisation:** The researcher had to be familiar with the data collected.

The data collected were collated from the field notes from observation studies and the data recorded. The data recorded in the local dialects like fanti and twi were translated to English. The researcher read the interview transcript and field notes over and over again to be very familiar with the contents of the data. Finally, the researcher ensured that the data were secured to protect confidentiality, and the participants' identities were kept anonymous because of ethical issues.

**2. Coding:** The researcher had to develop codes for the data to come up with themes.

The coding was done by labeling and organising the data transcribed to identify different themes and the relationships between them. The researcher assigned labels to words or phrases that represent important (and recurring) themes in the response by the participants. The labels were words and short phrases. The researcher used words and short phrases since they are easier to remember, organize, scan and skim. The deductive and inductive coding techniques were used during this period. These codes were developed based on the conceptual framework and reviewed literature vis-à-vis the objectives of the study. Using the conceptual framework, study objectives, and literature as a guide, the researcher was able to identify important issues that emerged from the data with the aid of deductive coding. By so doing, it helped the researcher to appreciate the meanings that originated from the data, and fostered easily location of specific themes.

The inductive strategy was utilised to record significant issues, perceptions, and thoughts that might be missed through the deductive approach in order to avoid missing any significant and unexpected opinions, thoughts, and expressions. This was accomplished by carefully examining the data multiple times to identify both overt and covert themes and concepts that recur in the responses even if they were not specifically addressed by the interview questions.

**3. Theme generation, review and refinement:** At this point the researcher generated themes based on the recurring patterns that emerged from the coding. The codes had to be reviewed and refined to align with the objectives of the study. After carefully reading the data several times and taking notes, the researcher described and organised the data into sub-themes as they appeared. The researcher continued

to categorise the data into major thematic subjects by aligning them to vital statements, units of meanings and new knowledge.

The researcher synthesised the data in order to explore the implications arising from the participants' reality and interpretations, elucidating the significance of their answers in relation to the study's objectives and existing literature. In order to ensure that the data was accurate and clearly represented, the researcher reviewed each theme and code.

4. **Writing:** Writing is also referred to as data presentation. The presentation was done by showcasing the themes that were finally created and chosen out of all the themes that emerged from the transcribed data. The researcher ensured that the data presentation was done in a clean logical manner to avoid misrepresentation and distortion of the actual findings from the participants. This was done to ensure and maintain the true representation of the findings.

### 3.14 Summary

The chapter has outlined the methodology used in the study, covering the philosophical assumptions, research approach and design, sampling techniques, data collection instruments, data collection procedure, ethical considerations, trustworthiness, and data analysis methods. The study utilised a qualitative approach, employing interviews and visual research (drawings and photographs) to gather data from 22 participants across two health facilities and the animation industry.

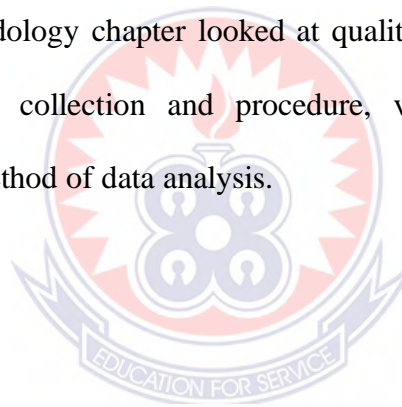
- **Philosophical Assumptions:** The research is underpinned by a defined philosophy that guides the entire methodological approach. It discusses ontology (the nature of social reality) and epistemology (the theory of knowledge), contrasting objectivism and constructionism in ontology, and

positivism and interpretivism in epistemology. The researcher aligns with an interpretivist viewpoint, emphasizing understanding through the interpretation of human behavior in a natural setting.

- **Research Approach:** The study employs a qualitative research approach, which involves exploring and understanding the meanings people ascribe to social phenomena. Qualitative research systematically interprets issues from the perspectives of the individuals or populations being investigated.
- **Research Design:** The study utilizes an Arts-Based Research (ABR) design, where art forms are integrated with traditional qualitative methods to allow for deeper insights, interpretation, meaning-making, and creative expression. ABR is particularly noted for its ability to transform and empower, potentially creating social change through creativity. The design is organized into three phases: pre-studio research, studio research, and post-studio research.
- **Data Collection:** Data collection techniques, including interviews and visual research are aligned with the interpretivist philosophy and qualitative approach.
- **Data Collection Process:** Involved seeking permission from health facilities, establishing relationships with health officers, booking appointments with participants, and conducting face-to-face interviews. The researcher assured confidentiality and retrieved images of visual materials used for Malaria health education. Direct observation provided first-hand information on educational materials and their utilization.
- **Validation of Instruments/Piloting:** Checklists were developed based on theories and literature and reviewed by colleagues, animation experts, health officers, participants, and experienced researchers. Piloting helped refine the instruments to ensure reliability.

- **Ethics and Trustworthiness:** The study adhered to ethical standards, including obtaining informed consent, ensuring voluntary participation, and maintaining confidentiality. Trustworthiness was addressed through credibility, transferability, and dependability, using methods like triangulation of data. All the names used for the participants were coded for ethical purposes and anonymity.
- **Method of Data Analysis:** The study employed thematic analysis, following Braun and Clarke's five-step approach: data familiarization, coding, theme generation, review and refinement, and writing. Spending equal interview time with each participant ensured consistency and trustworthiness.

In essence, the methodology chapter looked at qualitative, interpretivist, Arts-Based research design, data collection and procedure, validity of instrument, ethical trustworthiness and method of data analysis.



## **CHAPTER FOUR**

### **STUDIO RESEARCH AND PRODUCTION PROCESSES**

#### **4.0 Overview**

This chapter looks at the production procedures and techniques that were employed in the production of the animation using the conceptual framework which was developed from the research design and theoretical frameworks to ground the study. This chapter also shows the tools, materials and equipment used for the research, and how the researcher used the procedures and techniques for the creation of an animation to develop the finished animated artwork. This study was driven principally by the directives of the project.

#### **4.1 Tools and materials used for production**

Tools and materials are important items this study needed to do the development of the animation and to execute the study. Several pieces of equipment, software applications other devices were employed throughout the three phases of the production to answer research question two.

##### **4.1.1 Workstation Laptop Computer System**

The laptop computer was a very important device that was used for the production and the conduct of this study. A workstation is a network computer that is more powerful with respect to the processor speed and memory of the machine. Workstation is a high-performance computer system than the normal desktop computers. The workstation laptop computer was used to input all the necessary information in conducting this study. It was used to upgrade the thumbnail sketches to preliminary and comprehensive. It was also used for the creation of the scripts,

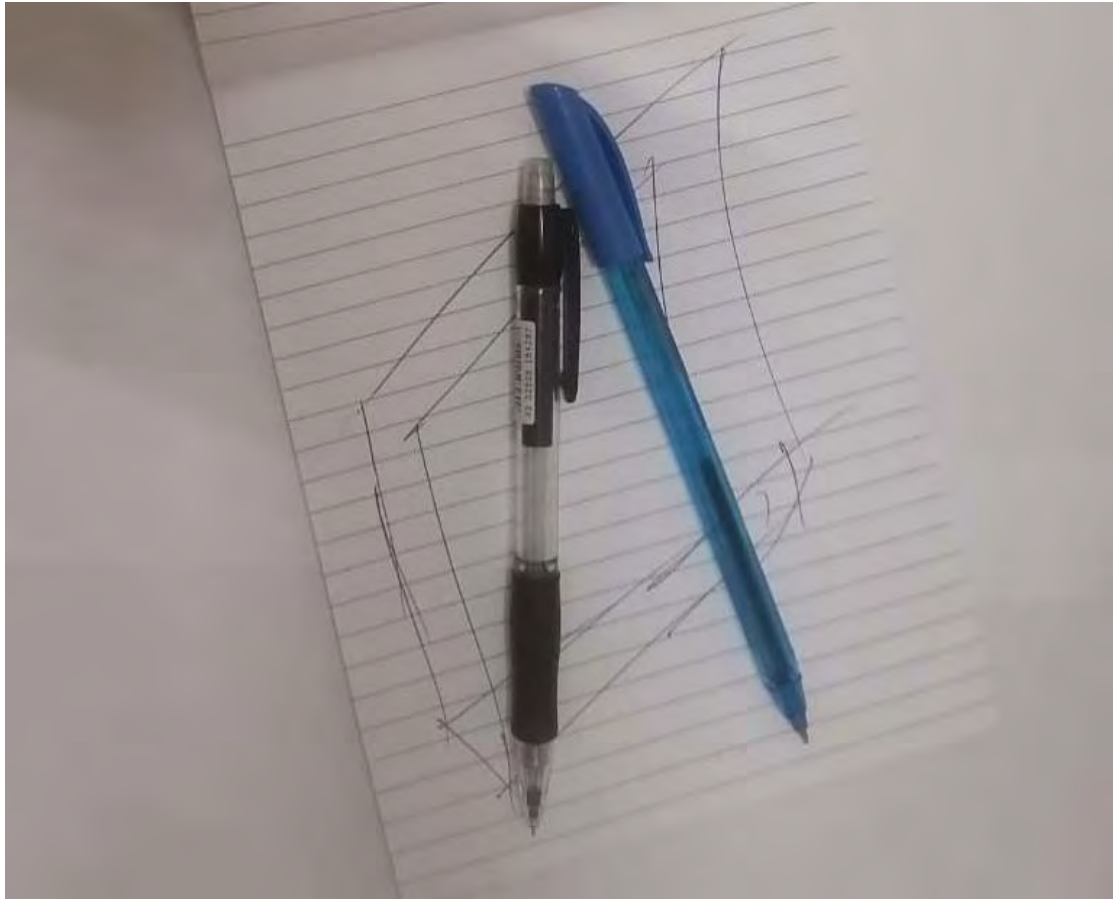
storyboard, viewing of images from the field, characterisation, modelling, editing, colour grading, animation and rendering of the animation. The development of animations and its rendering need a high performing computer system to help the researcher to work with ease and without any technological stress.



*Figure 6. Workstation Laptop Computer*

#### **4.1.2 Pen, Pencil and Notepad**

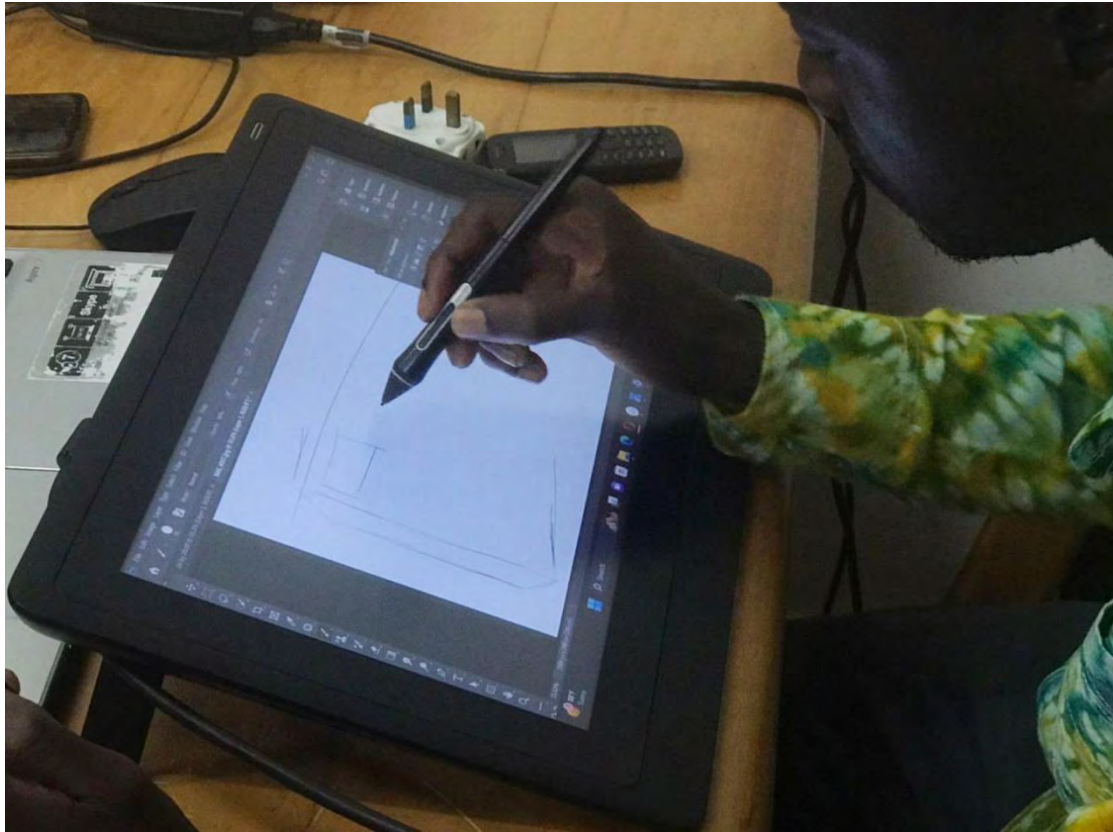
The researcher used a pen to write down ideas for the conduct of the study. It was also used for the recording during the data collection period. The pen and pencil, and notepad were used simultaneously for making the thumbnails and rough sketches during the early part of the study like making of scenes, characters and the environment for the development of the animation.



*Figure 7. Pen, Pencil and Notepad*

#### **4.1.3 Wacom Tablet**

The study employed the use of Wacom tablet as an electronic drawing aid for the production of the animation. The researcher has the flexibility of drawing all the sketches on the electronic drawing panel. The Wacom tablet facilitates the process of drawing sketches and improving them into preliminary and comprehensive sketches and layout, painting and colouring, modelling and designing of the structure and production of the animation.



*Figure 8. Wacom Tablet*

#### **4.1.4 Canon 6D Mark II Digital Camera**

A camera is defined by Bellis (2021) as a lightproof object with a lens that captures incoming light and directs the light and resulting image toward film or the imaging device digitally. The Canon 6D Mark II was used to capture the interesting features of the environment that were included in the development of the community setting in the production of the animation. For the purposes of appeal and familiarity, the scenes captured using the camera helped in grasping the attention of the community members and get them interested in the all the features of the animation to generate interest and desire in the application and practice of the message in the animation.



*Figure 9. Canon 6D Mark II Camera*

#### **4.1.5 Samsung Storage Device**

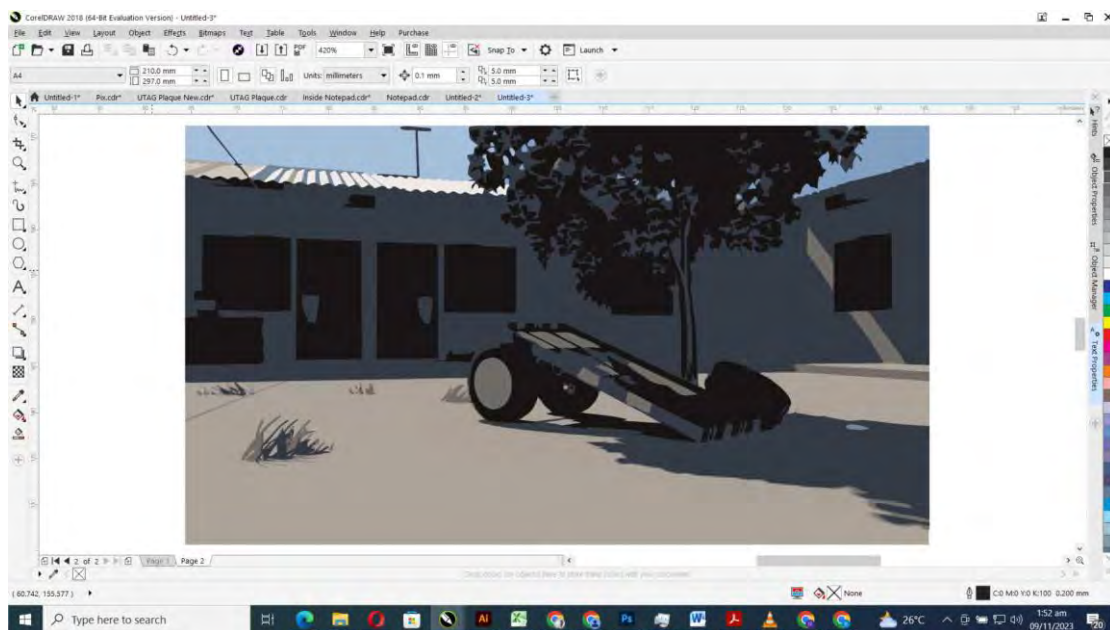
A 1-terabyte Samsung Portable SSD storage device was used to keep records of all the documents and files for the development and production of the animation and the study as a whole. Keeping of records digitally was necessary due to unforeseen and unexpected technological challenges one may encounter in the use and reliance of the technological devices during the conduct of this study.



*Figure 10. Samsung Storage Device*

#### 4.1.6 CorelDraw Software

CorelDraw is a vector-based designing application used by graphic designers for creating the powerful ideas they visualise. CorelDraw also has embedded bitmap-based features that aids in working on images as well. The researcher used CorelDraw 2018 application for the structure of the storyboard and comprehensive sketches. The researcher sees CorelDraw as a flexible application to support this study, hence, its usage.



*Figure 11. Interface of CorelDraw 2018 Software*

#### 4.1.7 Autodesk Maya Software

Autodesk Maya software is a 3D graphics application. It is a tool that designers use for 3D animation, modelling, visual effects, simulation, rigging and rendering. The researcher used the Autodesk Maya 2022 software for the 3D animation, characterisation and modelling, all the visual effects which include lightening and others for the production of the animation. Autodesk Maya is an industry standard application for 3D animation. It is widely considered to produce more animation works.

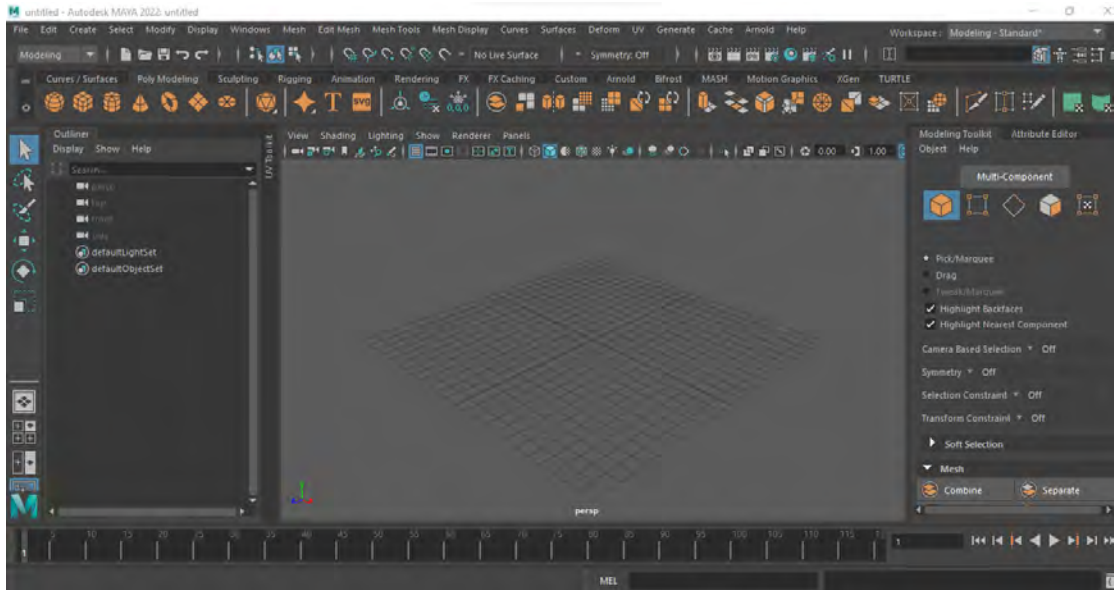


Figure 12. Interface of Autodesk Maya Software 2022

#### 4.1.8 Cubase Studio Software

Cubase Studio software is a digital audio workstation (DAW) software tool used by music producers, composers etc. The researcher used this software for the voice over audio recording, digital manipulation, editing and composition of the background sound in the animation.



Figure 13. Interface of Cubase 11 Digital Audio Workstation  
 Music, Computer. “Steinberg Cubase 11 Review.” *MusicRadar*, 10 Nov. 2023,  
[www.musicradar.com/reviews/steinberg-cubase-11](http://www.musicradar.com/reviews/steinberg-cubase-11).

#### 4.1.9 Adobe Premier Pro Software

Adobe Premiere Pro application is a video-editing software used for editing videos. The researcher in this case used the application for editing and rendering of the animation into a video file format. It was also used to edit the voice recording.

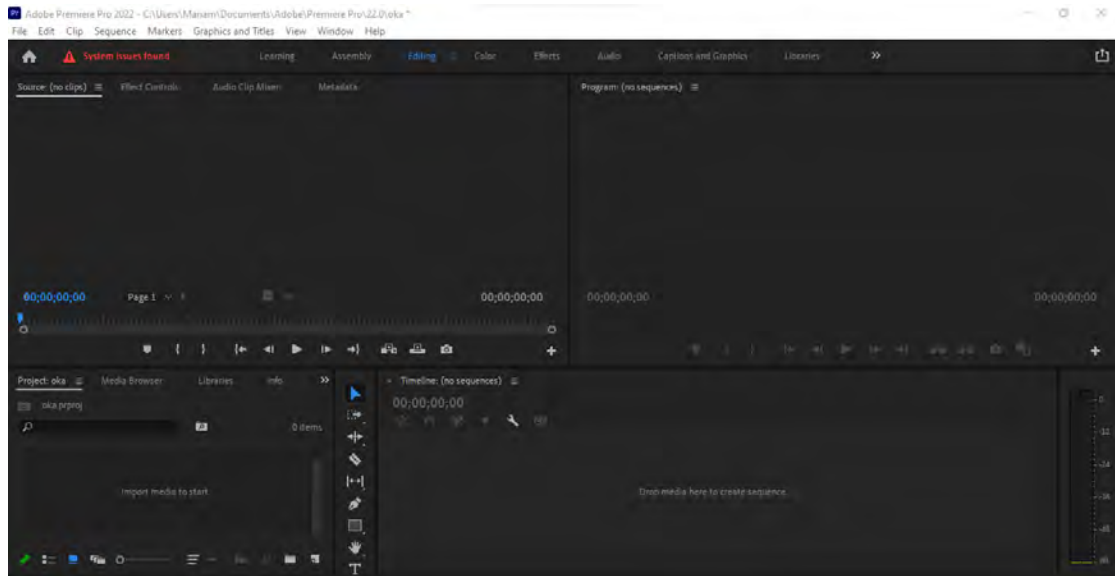


Figure 14. Interface of Adobe Premier Pro Software

#### 4.1.10 Adobe Photoshop Software

Adobe Photoshop is a bitmap-based applications used for editing bitmap images like photos. The application was used for retouching and colour grading of the characters and the environment in the animation.

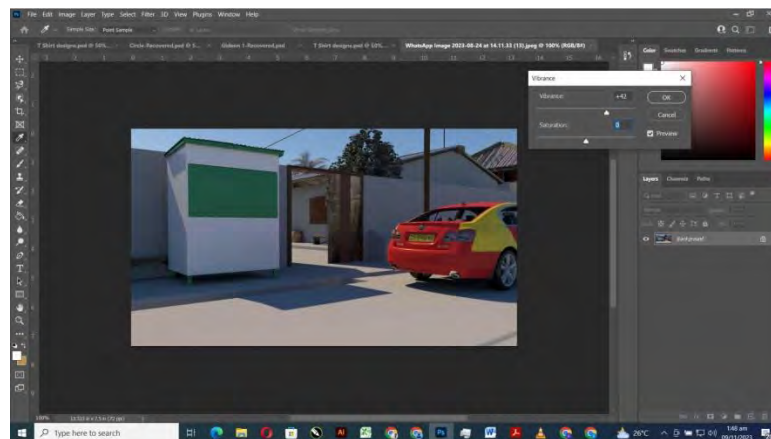


Figure 15. Interface of Adobe Photoshop Software

#### 4.1.11 Shure Microphone

Shure microphone is a condenser microphone suitable for recording vocalists, amplifiers and acoustic instruments. It is created for professional studio applications. Shure microphone is a solid sound equipment that has a noise-reduction high-pass filter which has the capacity to avoid external noises from interfering in a recording process. It controls the recording environment and gives quality sound. The Shure microphone was used to record the voice over.



*Figure 16. Shure Microphone*

Source: [www.shure.com](http://www.shure.com), <https://www.shure.com/pt-BR/shows-e-producoes/louder/how-to-record-and-mix-vocals> Accessed 10 Nov. 2023.

#### 4.1.12 UEW Music Studio

The studio is the indoor location for recording voice over audios, music vocalists, etc. The UEW Music Studio is located on the UEW Central campus in Winneba. The studio is well equipped with high quality equipment and sound proof features. The researcher used the space for the voice-over recordings for the animation.



*Figure 17. The Audio-Visual Centre, Technology Block, Central Campus, UEW.*

#### **4.3 Why the use of 3D Animation**

For purposes of anonymity and ethics, all the names used were coded. Findings from the animation experts, M. Milly and T. Rockson suggested that the study uses 3-dimensional animation. According to both of the experts, using 3D animation offers several advantages for communication. The animation is to be engaging and easily understood by viewers of all ages and literacy levels. This is to allow clear and engaging visualisation of Malaria cause and effects of the disease. The animation is to create a powerful emotional connection with viewers, making the message more impactful. The animation style is customised to reflect Ghanaian culture and aesthetics, making it relatable to the intended audience who are the indigenes and residents of Effutu.

Milly expressed the essence of using 3D animation for the study. According to the expert, 3D animation gives high realism of the features and elements used in the animation. Also, it helps to make the piece very interactive.

*The 3-dimensional form of animation offers interactivity, greater realism and versatility. Expression of realism and interactivity facilitates easy connection with the audience culturally (M. Milly, personal communication, October 26, 2023)*

The inference above connotes that elements used in the animation must resonate with the cultural values of the audience. Hart (2011) avers that, by combining vibrant colours, captivating storylines, and engaging characters, 3D animation can transcend cultural barriers and resonate with audiences of all ages, fostering connection and understanding. This makes a 3D animation a powerful tool for raising awareness about Malaria, promoting preventive measures, and encouraging Ghanaians to seek prompt medical attention when infected. It allows the researcher to simplify complex scientific concepts like the parasite's life cycle without compromising accuracy (McCloud, 2014).

*Animation offers a unique platform to tell this sensitive story with nuance and clarity. The communication power of this animation will also have a lot to do with the language used and familiarity of the environment featured in the storyboard. (T. Rockson, personal communication, October 10, 2023).*

Communicating with the intended audience in the language spoken locally in the Effutu municipality guarantees that the message is comprehended clearly. Words and phrases that have a deeper meaning in local dialects than in translations are frequently found there. Considering the views of Rockson, the audiences hearing their own language is makes them pay closer attention to the message and feel more invested in the story. The feeling from the animation is more relatable and culturally relevant on the characters speaking the language the audience uses in their everyday life.

While other languages might be understood, English may not be the first language for everyone, especially in rural areas. Fanti, though related to Effutu, there

might be slight differences that could cause some confusion. So, the reason to have the animation in the language the community members usually communicate with.

*The animation must have subtitles to help with the understanding of the message. Subtitles are included in language versions for a broader reach, with the intended purpose of reaching hearing impaired and non-native speakers. This allows for the message to be effectively communicated to a wider audience (T. Rockson, personal communication, October 10, 2023).*

The views of the M. Milly and T. Rockson show that prioritising the local language creates a more impactful and culturally sensitive animation that effectively raises awareness about Malaria prevention. Subtitles in general support the understanding of a text spoken in any local language. The animation needed an English subtitle to cater for the audiences who may not understand the Fante language used in the animation.

### **4.3 Creative Process and Concept Development**

There are three major stages in the creative process that an individual must go through in order to achieve a complete animation. The chapter is organized into three (3) parts, namely pre-production, production and post-production. The preproduction looks at the following, Content Development, Scriptwriting, Storyboarding, Character Design and Voice-over Recording. Production considered Modeling, Texturing, Rigging, Deformation and Blending Shapes, Animation, Lighting and Rendering. The final phase, which is post-production, touched on Compositing and Visual Effects, Editing, Final Sound Scoring and Delivery.

Below shows the graphical sequence followed for the production of the animation.



*Figure 18. Animation processes adopted for the study*

### 4.3.1 Pre-Production

A well-crafted script forms the backbone of a film, pre-production is the cornerstone of a successful 3D animated project (McCloud, 2014). Pre-production delves into the intricate steps the researcher took to translate the passion for raising Malaria awareness into a compelling visual narrative. Like building a house on a solid foundation, thorough pre-planning ensures a smooth animation journey, minimizes costly mistakes, and unites a team under a shared vision (Adams, 2018). By carefully constructing the story framework, visual style, and logistical elements during this stage, the researcher aimed to create a powerful and impactful animation that informs, engages, and empowers audiences globally.

### 4.3.2 Preproduction: Content Development

This stage of the preproduction needed a well-structured content to guide the animation. The content here is the message which is the important aspect of the animation. The message is the engine of the animation. The message used for the animation was developed with all the relevant stakeholders. In this case the health officers and the selected community folks. These participants were involved because

they are the end-users of the final animation, and it is very essential to include them in the message and content preparation processes.

The content designing stage took two (2) phases; namely

1. Phase One: Creative Strategy and Message Development
2. Concept and message development

### **4.3.3 Creative Strategy and Message Development**

In the animation development, the researcher relied on the conceptual framework which was developed from the tenets of the AIDA Model and Cognitive Theory of Multimedia Learning (Please refer to Theoretical Framework and Conceptual Framework in Chapter two for further details) as a guide to design the creative strategy and the message.

The researcher first and foremost engaged the health officers at the two (2) health facilities after getting approvals from their Health Directors (See Appendix A for a copy of the permission letter and approval letter). The aim of the engagement was to outline the approved causes and preventive measures of Malaria from the health officers, and also to know the main objective of the message to be used for the animation. The researcher compiled the responses and used them for the next stage of the research. Table 2 shows a summary of the responses used for the creative strategy.

**Table 2:** *Summary of findings from the data collected from health officers*

<p><b>1. What core messages regarding Malaria should be promoted?</b></p> <ul style="list-style-type: none"> <li>• The causes and preventive measures should be captured.</li> <li>• The promotion should talk about the causes of Malaria and the dangers attributed to Malaria.</li> <li>• The message should look at the preventive measures because it is important.</li> <li>• The promotion must capture the dangers and precautions of Malaria.</li> <li>• The promotion of mortality reduction.</li> </ul> <p><b>2. What should be the main objectives of the message?</b></p> <ul style="list-style-type: none"> <li>• The main objective of the message should be Malaria, good environment and cleanliness.</li> <li>• For the community members to be able to protect themselves from Malaria.</li> <li>• By the end of the message, clients (community members) should be able to understand the preventive measures of Malaria.</li> </ul> <p><b>3. What are the recommended preventive measures of Malaria?</b></p> <ul style="list-style-type: none"> <li>• Sleeping under insecticide-treated bed nets (ITNs).</li> <li>• Destroying mosquito breeding places.</li> <li>• Wearing of protective clothing, long sleeves if out of doors at night.</li> <li>• Injecting Malaria vaccines for babies.</li> <li>• Drain all stagnant waters.</li> <li>• Weed bushy surroundings.</li> <li>• Using mosquito repellants.</li> </ul> <p><b>4. What message source factors need to be considered in the animation/cartoon?</b></p> <ul style="list-style-type: none"> <li>• Knowledge on Malaria prevention and treatment.</li> <li>• Transmission of Malaria.</li> <li>• Causes of Malaria.</li> <li>• Prevention of Malaria.</li> </ul> <p><b>5. Which language will you prefer the animation to use as its voiceover?</b></p> <ul style="list-style-type: none"> <li>• Twi and Fante.</li> <li>• Language the people understand, Fante.</li> <li>• Fanti and Effutu.</li> <li>• Fanti, Effutu and English.</li> </ul> <p><b>6. How would you want the community dwellers to feel after watching the animation/cartoon?</b></p> <ul style="list-style-type: none"> <li>• That Malaria is a deadly disease, but can be controlled and prevented.</li> <li>• I want them to be educated on how serious Malaria is.</li> <li>• I want them to be conscious of the causes of Malaria and its preventive measures.</li> </ul>
---

*Source: Researcher's fieldwork, 2024*

The researcher went further to interact with the selected community folks to get their knowledge of Malaria and views on the makeup of the animation. The table below shows the data collected from the participants.

**Table 3:** *Summary of findings from the data collected from community folks*

**Mass media aid used to provide information on Malaria and its prevention**

- Television
- Radio
- Community Centres PA Systems
- Posters
- Health Officers face-to-face interaction

**Language used in providing information on Malaria on the mass media aid**

- Fanti, Effutu and English

**Prefer local language used in providing information on Malaria on the mass media aid**

- The majority of the participants mentioned Fanti. Then followed by Effutu and Twi.

**Causes of Malaria**

- Majority said mosquitoes in unclean and busy areas.
- Exposing one's body without wearing protective cloths when in dark areas.
- Open clean stagnant waters in our environment breed mosquito.
- Not disinfecting our environment with mosquito sprays.

**Prevention of Malaria**

Majority of the participants said the following;

- Disinfecting our environment with mosquito sprays.
- Applying mosquito repellants.
- Wearing long pants and sleeves, and socks to cover skin.
- Sleeping under treated mosquito nets.

*Source: Researcher's fieldwork, 2024*

The researcher collated all the responses from the health officers and the community folks in to a table to enable the researcher know the important aspects of the responses that need to be highlighted and emphasised upon when developing the message to be used for the animation. The important aspects of the responses guided the researcher to identify the portions of the messages that needed the adaptation of the theories employed for the study. This exercise is meant to provide the animation viewers the

salient information that would impact on their decision practice the preventive measures and spread of Malaria in their households.

#### 4.4 Message Development

Based on the above findings, table 4 was developed to guide the message structure and the key pointers that need to be captured in the animation.

**Table 4:** *Message Development Guide*

<b>Health Officers and Community folk's know-how and expectations</b>	<b>Message Focus</b>
Knowledge of Malaria	Animation must prioritise information on Malaria
Causes of Malaria	Animation must feature the causes of Malaria
Preventive Measures of Malaria	Animation must feature the preventive measures of Malaria
Preferred Language	Animation must be in Fante and translated into English
Cultural representation (Sound and images)	Audio-visual features in the animation must be familiar with the participants

*Source: Researcher's fieldwork, 2024*

#### 4.5 Concept and Story Development

The concept to be used in the animation is very key. It should reflect the focus of the message. Based on the findings of the data gathered and the chart developed above, the researcher developed two (2) concepts to house the message in the animation. During this phase, visual thinking was primarily used to conceptualize and illustrate message goals via visual storytelling. Variety of writing activities, visual thinking, writing, contemplation, and reviews with health officers guided the researcher.

Out of the two (2) concepts, the first idea was to use a man as the main character to create a story that incorporates the message goals and the intended communication in the animation. The second concept was to use a health officer as the major character to share the message goals and the intended communication in the animation.

Below are the two (2) concepts.

***Concept One***

Nenyi goes the market to buy foodstuff for his household. He exposes his body to flies and mosquito because of the open drains in and around the market. He goes home and leaves his trapdoor ajar while trash cans meant for rubbish are also left open. Nenyi does not sleep in the treated mosquito net, neither does he wear protective clothing when sitting outside. Nenyi experiences severe headache and feels feverish. His co-tenant observes that Nenyi is in discomfort and offers to take him to the hospital to get treatment. At the hospital, Nenyi's condition gets serious because he had initially opted to do self-medication rather instead of going to the hospital after realizing the symptoms of Malaria. The self-medication could not cure him so when he was sent to the hospital by the co-tenant it was too late for him to be treated and saved. Nenyi died at the hospital because it was too late. The preventive measures of Malaria were mentioned as precautions for viewers.

*Figure 19. Message Concept 1*

***Concept Two***

A patient is sent to the hospital for Malaria treatment. The patients sitting at the OPD sees the patient who was rushed to the hospital for treatment. Patients sitting at the OPD of a medical facility are engaged by a health officer who talks about the causes of Malaria, its preventive measures and the dangers. The patients ask questions and responses are given by the health officer.

*Figure 20. Message Concept 2*

The two (2) concepts were shown to the health officers and community dwellers for their views. After several suggestions and ideas, concept one (1) was the preferred one by majority of the participants. Concept one (1) was chosen because the use of a character who is not a medical officer will help the community folks to appreciate the message in the animation since the animation is meant for the community.

#### **4.6 ARTISTIC TECHNIQUES AND METHODS**

##### **4.6.1 Conceptual Stage: Malaria, a Global Issue**

***Seed Idea: A 3D animation on Malaria***

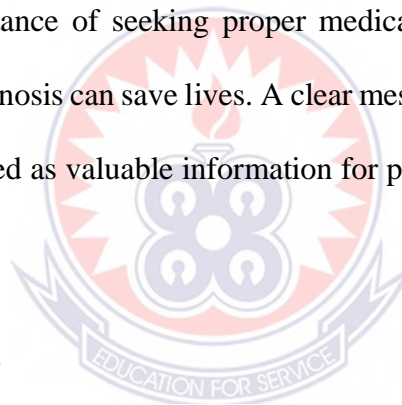
NENYI: A 3D Character designed to depict Ghanaian people in a story setting in the Effutu municipality, Central Region of Ghana.

A youthful gentleman who disregarded the preventive measures of Malaria and did not protect himself from the bites of mosquitoes. He stood where mosquito colonies were located and purchased food from unclean sources. He lacked Malaria prevention drugs and did not sleep under a treated mosquito net. When he became ill, he did not

visit the hospital instead choosing self-medication. He was eventually taken to the hospital, where he passed away.

#### **4.6.2 Specific Aspects and Emotions**

The watching of the animation about Nenyi draws to experience a range of positive emotions and appreciate specific aspects: The story's setting in Effutu Municipality and use of Ghanaian characters creates a sense of familiarity and connection for viewers. Seeing Nenyi's suffering and worry is to evoke empathy and concern for the impact of Malaria on individuals and communities. The animation emphasizes the importance of seeking proper medical care; viewers are relieved to know that an early diagnosis can save lives. A clear message about preventive measures of Malaria is appreciated as valuable information for protecting families.



#### **4.6.3 Moral Lessons**

The researcher considered the moral lessons to guide the making of the animation. Ignoring the threat of Malaria can lead to severe illness and even death. Using mosquito nets, repellents, and avoiding stagnant water are crucial for avoiding infection. Buying food from clean vendors and maintaining a clean environment helps reduce mosquito breeding grounds. Seeking medical help immediately upon feeling symptoms of Malaria is vital for successful treatment.

#### **4.7 Script**

Main Character's Name: **Nenyi's**

##### **Main Acts**

Beginning Scene = Opening scene (Motion Graphics; Educational Graphics Animation)

Middle Scene = 3D Animation

End Scene = Moral Lesson

##### **Sub Acts**

Beginning Scene = Opening scene (Motion Graphics)

Educational Graphics Animation on World Health Organisation (W.H.O)

Voice Over on Malaria

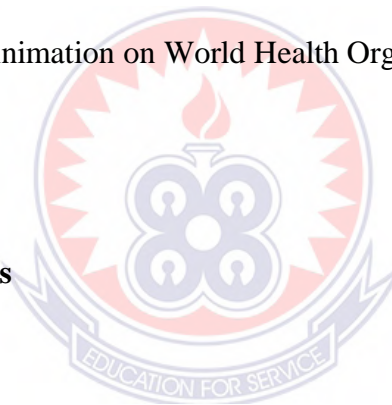
Voiced by Nenyi's

##### **Environmental settings**

Home

Market

Hospital



##### **Act 1**

Location: In the Living room

Tone: In the Morning

##### **Scene 1**

Nenyi is eating breakfast and watching television in the living room

***Close up shot camera position***

Panning movement of the camera facing Nenyi moving from the right side to the left side.

***Long shot camera position***

Candid shot setup camera placement showing both Nenyi and the television screen

***Extremely Long Shot***

Camera zooms very slowly when placed to capture the environment with Nenyi neighbour sitting in the environment.

**Act 2**

Location: Market

Tone: Afternoon

***Interlude***

In the Afternoon, Nenyi gets out of the house to get to the market to buy some foodstuffs for cooking the afternoon food

**Scene 2**

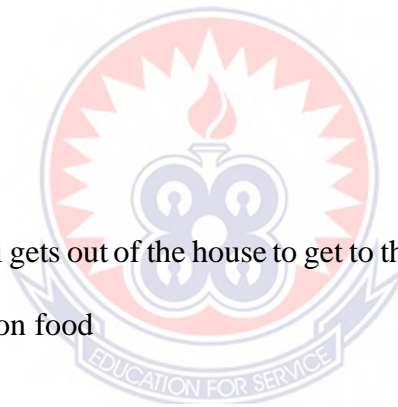
***The environment***

Wide Shot: Camera placement showing the community, and some vehicles moving  
Camera Zoom to Nenyi walking past the taxi, crossing the road, and heading to the market.

***The Market Scene***

Interaction between the Seller and the Buyer

The camera is placed at a slightly distant shot from the back of Nenyi, facing the woman market seller.



Interaction happens in a market scene with a dirty, filthy environment, with house flies, mosquitoes, insects, and a load of waste in the surrounding gutters, among other things, around the selling joint.

Camera pans from a distance shot down to the filthy gutter, which was left uncovered. Nenyi was buying some foodstuffs for food preparation at home.

Camera zooms closer to Nenyi buying the food at the marketplace with mosquitoes biting him, as he stands for 10-15 minutes, and zooms out to view the interaction of the buying and selling between Nenyi and the market woman.

### **Act 3**

Location: Compound

Tone: Afternoon

*Interlude*

Cooking in the afternoon

### **Scene 3**

***The cooking scene***



Nenyi is cooking outside the house on the compound of his environment. With the rubbish bin open and the mosquito flying around.

The camera zooms in on Nenyi cooking in the environment. Viewing shows both Nenyi, the cooking, and the environment.

The camera zooms out of Nenyi cooking, capturing the close-up view of Nenyi, the cooking process, and the setting.

Nenyi's co-tenant walking outside to pour rubbish into the full dustbin of rubbish already, this rubbish all around, invites more mosquitoes, these mosquitoes bites and suck the human blood for blood, which intent releases the Malaria parasite into the

blood stream to cause the Malaria disease. This is seen in the case of Nenyi cooking outside and the mosquito biting him. This negligence also paved the way for more mosquitoes to enter Nenyi's room.

### **Act 3**

Location: Bedroom

Tone: Night

#### *Interlude*

Without any mosquito net, Mosquito bites cause Malaria

### **Scene 4**

Camera moves from the bedroom window and follows a mosquito to the sleeping place of Nenyi

Camera zooms out to the full view of the mosquitoes biting Nenyi, as he sleeps not under the mosquito net and without a cloth covering him.

#### *Interlude*

Days later, Nenyi experienced Malaria from the continuous mosquito bites night by night without sleeping under any mosquito net, and preferred self-medication for 2 days.

### **Scene 5**

Camera zooms in on Nenyi sitting on the bed, feeling headaches and shaking feverishly as Malaria starts revealing on him.

Camera zooms in on Nenyi sitting on a chair, taking self-medication.

#### *Bridge*

Location: On the compound

Tone: Morning

*Interlude*

Malaria becomes uncontrollable and manifests severely.

**Scene 7**

Camera placed on Nenyi, as he shows signs of several Malaria manifestations by his high body temperature, shivering and vomiting in the compound.

Camera zooms in on Nenyi co-tenant showing facial expressions and body emotions upon the seeing of the Nenyi showing severe signs of Malaria conditions.

**Act 4**

Location: Hospital

Tone: Morning

Interlude

Community environment on the journey to the hospital through car as a means of transportation

Arial view camera shot of the taxi entering the Trauma hospital.

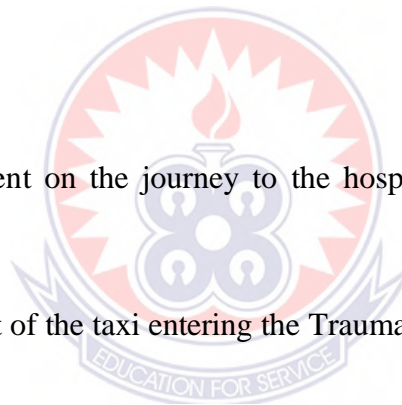
**Scene 8**

Camera placed to follow Nenyi and his co-tenant entering the hospital to seek medication.

Camera zooms in on Nenyi sitting on the hospital bench.

Nenyi's Malaria condition became much worse and he was admitted at the Trauma Hospital

Camera zooms in on Nenyi in the hospital bed, as he was not able to respond well to the Malaria treatment prescribed and given, and cuts in on his death on the bed.



Interlude

Flashback of the animation event

Mentioning of the preventive measures of Malaria.

#### **4.7.1 Story Blueprint**

The script serves as the foundation, plan and blueprint for the entire animation. It methodically outlines the story's structure, dialogue, and action, ensuring narrative coherence and clarity. A well-crafted script ensures that all creative teams, from animators to voice actors, have a clear understanding of the story's flow and the characters' motivations. This improves collaboration, avoids production mistakes, and maintains consistency across the animation (McCloud, 2014).

#### **4.7.2 Emotional Arc and Character Guide**

The script is truly the genesis point for bringing characters to life within an animated production. It is within the written words that a character's distinctive voice, their range of emotions, and their core personality traits are first established. This textual foundation is not just descriptive; it serves a crucial practical purpose. It functions as an essential guidepost for both the voice actors, who must interpret and vocally embody these characteristics, and the animators, who translate these traits and the character's emotional arc into visual performance (Seger, 1990). According to screenwriting principles highlighted by Seger (1990), a well-defined character within the script allows these creative teams to work towards an authentic portrayal, effectively conveying the character's inner world and journey to the audience.

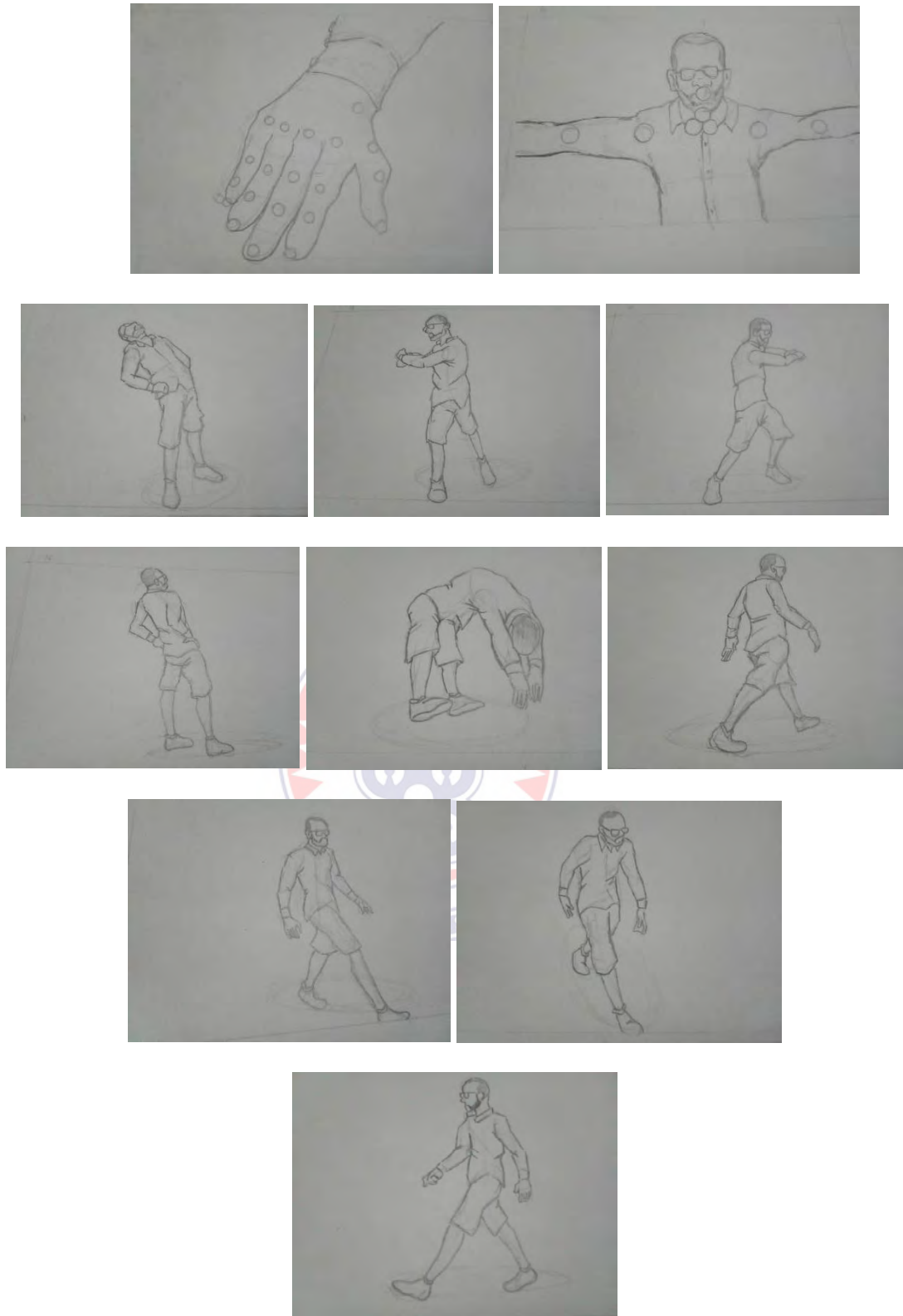
## 4.8 Sketches

The researcher made several sketches to capture the various scenes and characters seen in the animation. The character sketches included thumbnails, preliminary and comprehensive. The sketches were done manually and digitally.

### 4.8.1 Character Sketches



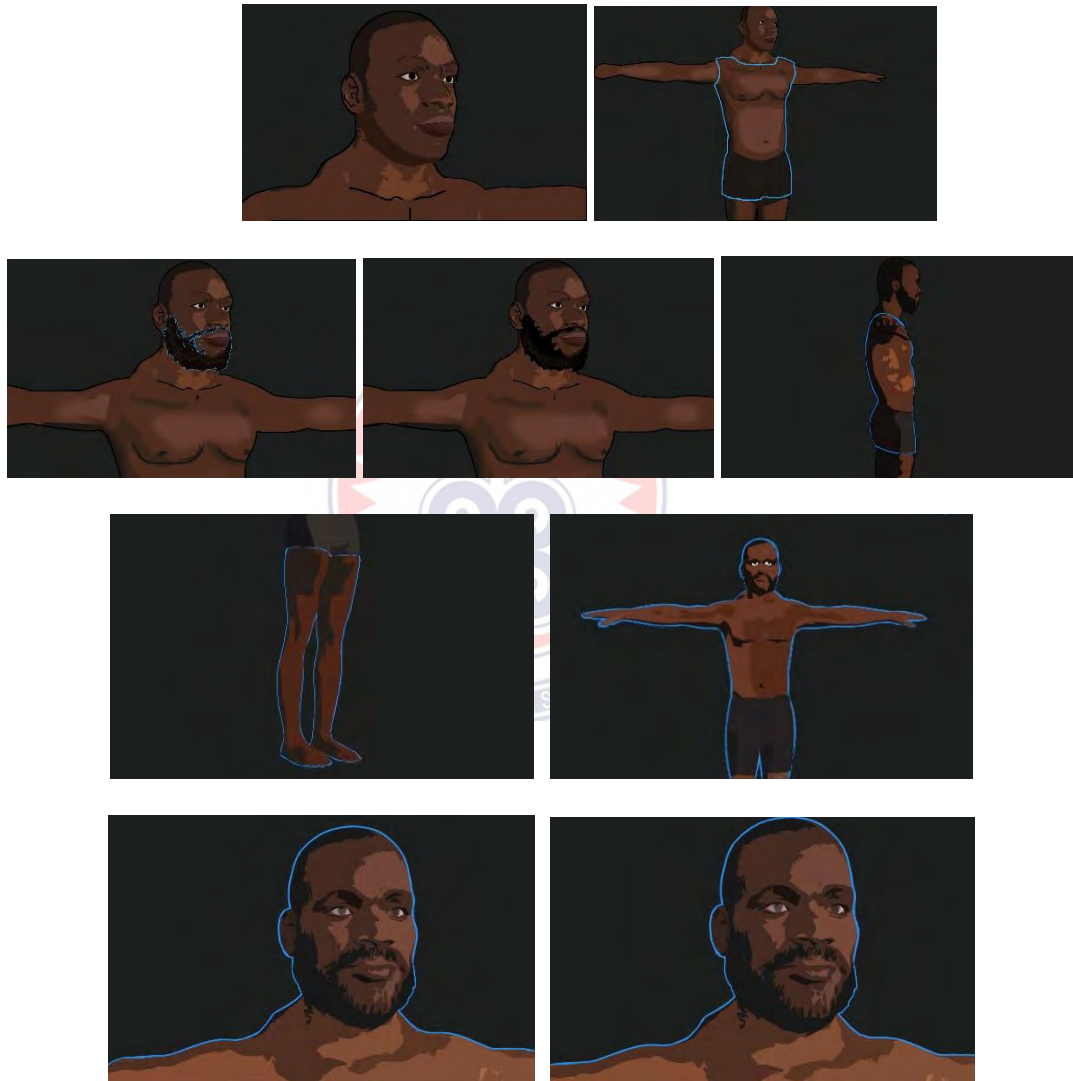
*Figure 21. Visualizing the Character through drawing*



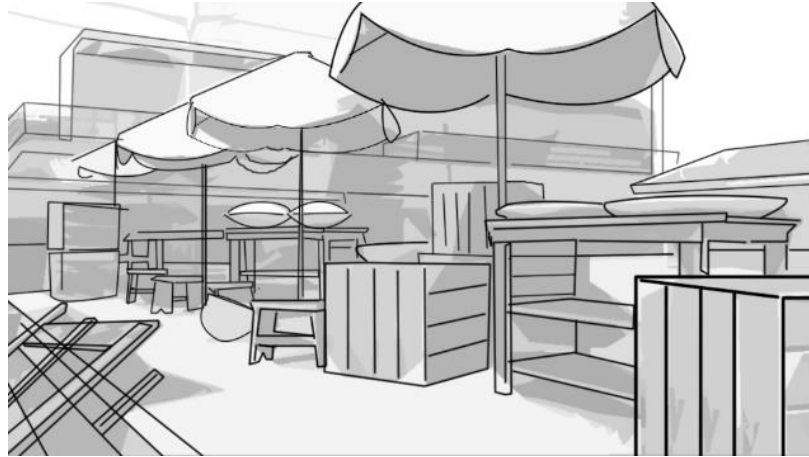
*Figure 22. Visualizing the Character actions/movements through drawing*



*Figure 23. Digital Drawing from reference drawing*



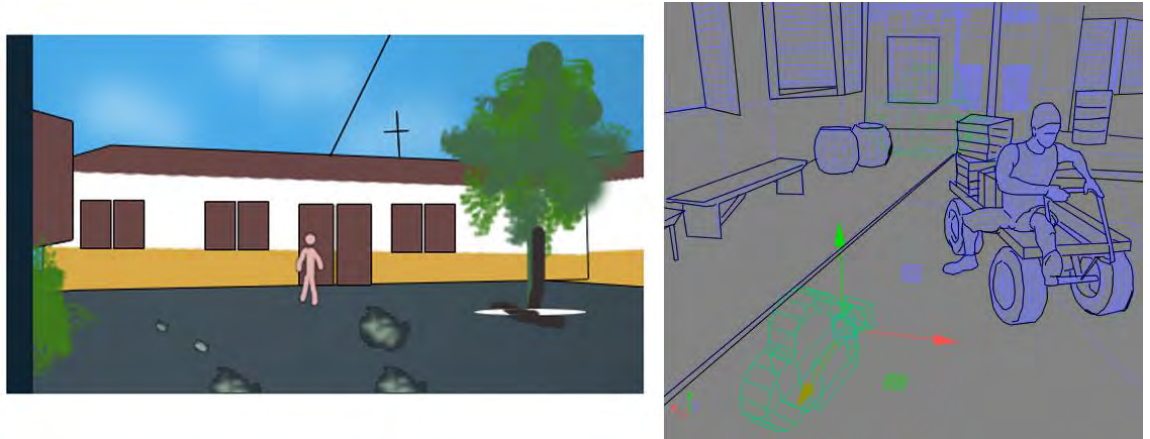
*Figure 24. Visualizing the Character through digital painting using Adobe Photoshop software*



*Figure 25. Visualizing the Environment on digital drawing and painting*



*Figure 26. Visualizing the Sky and atmosphere tones on Environment*



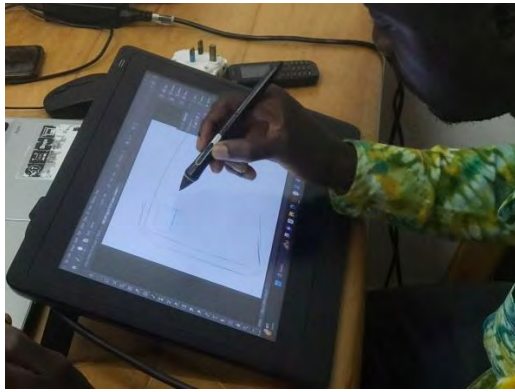
*Figure 27. Visualizing Camera placement on scene*



*Figure 28 Visualizing swinging of the foot through animation*

#### **4.9 Storyboard**

McCloud (1994) argues that storyboarding allows creators to experiment with different pacing, framing, and camera angles before production begins. Storyboarding is a visual planning tool used to sequence shots, events, and actions within a narrative. It essentially creates a comic strip-like layout that outlines the key moments and visuals of your story, before diving into production.



*Figure 29. Storyboard creation in digital form using Adobe Photoshop*



Figure 30. Final digital Rendition of the creation of the storyboard using the Adobe Photoshop software



Figure 31. Final rendition of Storyboarding

Creating a storyboard in Photoshop involves systematic planning and utilization of its tools to visualize the narrative effectively. Storyboarding acts as a visual roadmap, laying out key frames, camera angles, and sequences of the animation (McCloud, 1994). Below is a detailed description of the process:

Photoshop, developed by Adobe Inc., is a powerful graphic design software used for image editing and digital painting. It enables artists to create detailed visuals, including storyboards, by utilizing its versatile set of tools (Adobe, 2024).

The Brush Tool in Photoshop is a versatile feature used primarily for drawing and sketching. The tool was employed to create rough sketches of scenes and characters. Artists used it to add fine details like facial expressions, movement lines, or background textures, which are crucial for conveying the emotional tone and visual dynamics of the storyboard. Different brush sizes, shapes, and opacity settings allowed the researcher to experiment with various artistic effects to suit the storyboard's aesthetic and purpose.

The Shape Tool allows users to draw basic shapes, such as rectangles, circles, and polygons, which are integral in organizing visual elements. The researcher used this tool to design frames or panels that separate individual scenes. These panels ensured the narrative's flow and structure remained clear, making it easier for production teams to interpret the visual script. The tool's alignment and snapping features made it possible to create evenly spaced and proportioned panels, enhancing the storyboard's professional appearance.

Layers Panel help facilitate separate elements such as backgrounds, characters, and props for better editing flexibility. It is a central feature in Photoshop that allows users to organize and manipulate different elements independently. Separate layers

were created for backgrounds, characters, props, and annotations. This layering system provided flexibility for editing individual components without affecting others. The background layers established the setting for each scene. The foreground layers highlighted key character actions. The annotation layers included notes about movements, emotions, or camera directions. By isolating components, the Layers Panel enabled easy iteration, corrections, and modifications during the storyboard refinement process. The Layers Panel is a central feature in Photoshop that allows users to organize and manipulate different elements independently.

Artboards helped in arranging multiple scenes within a single document for streamlined visualization (Adobe, 2024). Artboards were utilized to divide the scenes into individual frames, allowing for clear organization. Artboards in Photoshop are canvases within a single document that allow users to work on multiple layouts simultaneously. The researcher used Artboards to design and manage multiple scenes within the storyboard. Each Artboard represented a unique shot or sequence, which could be revisited and edited independently. Artboards enabled the researcher to view the entire storyboard at once, ensuring continuity across scenes. They also simplified exporting and presenting individual panels for feedback and further production steps.

By leveraging Photoshop's advanced tools and integrating additional software like Microsoft Word, the storyboard creation process ensured clarity and precision. This approach enhanced team collaboration and helped maintain the narrative flow during production.

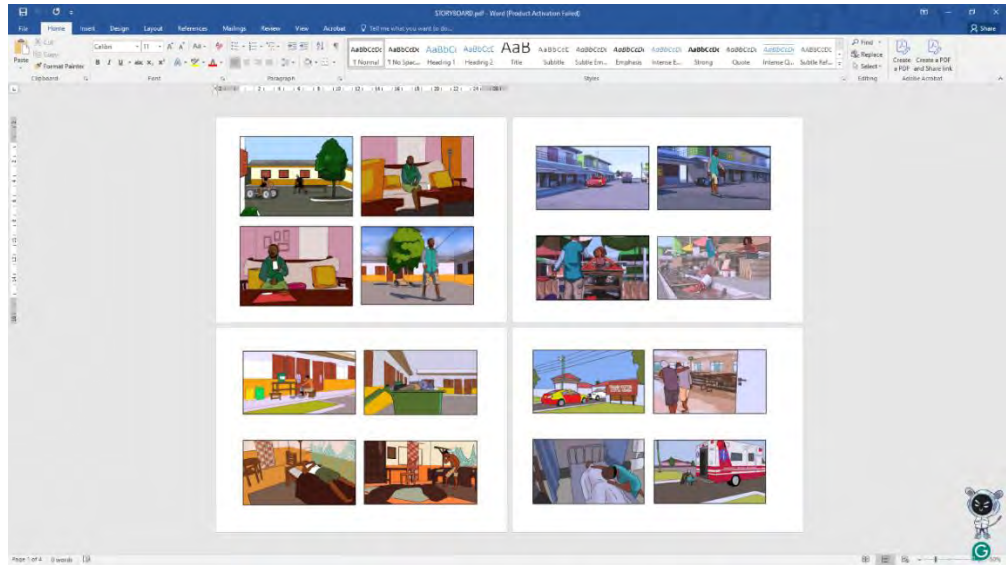


Figure 32. Placing the Storyboard inside Microsoft Word

#### 4.10 Scenes, Camera angles and camera position

##### Scenes

Outdoor park scene: Individuals sitting and interacting in an open space with trees and a building in the background.

Indoor living room scene: A character seated on a sofa in a domestic setting.

Street/market scenes: Depicting a bustling market environment with characters engaged in activities such as shopping.

Hospital scenes: Depictions of an ambulance, hospital entrance, and indoor hospital settings showing care and concern.

Domestic chores: Characters performing household tasks such as cooking

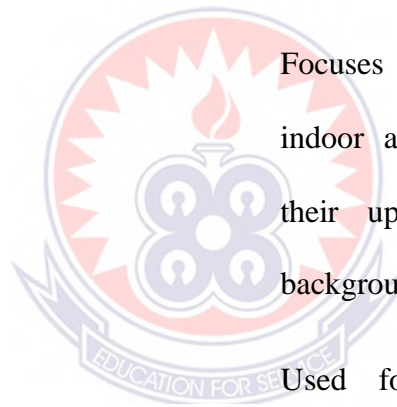
Rest and struggle: Showing characters sleeping, reflecting, or facing challenges in personal settings.

### ***Camera Angles***

Wide Angle/Establishing Shot: Used in the park and street scenes to set the context and environment.

Displays the broader environment and the placement of characters.

Medium Shot: Focuses on individual characters in indoor and outdoor settings, capturing their upper body and part of the background.



Used for conversations or specific actions, such as buying items in the market.

Close-Up Shot: Highlights emotions or detailed actions, like facial expressions or interactions with objects.

Applied in scenes like the hospital bed to capture emotional moments.

Over-the-Shoulder Shot: Depicts interactions from one character's perspective.

Used in market and hospital scenes to involve the viewer in the character's viewpoint.

### ***Camera Positions***

**Eye Level:** Used for most scenes to create a neutral and relatable perspective.

Common in the living room and market scenes.

**Low Angle:** Provides a sense of scale or importance.

Used for dramatic effect when showing buildings or ambulances.

#### **4.10.1 Environment settings and mood tones**

##### ***Environment Settings***

##### ***Outdoor Scenes (Park and Streets)***

*Details:* Open spaces, trees, benches, and distant buildings. Streets are shown with vehicles and market activity, capturing the realism of a lively environment.

*Purpose:* These settings create a natural and social atmosphere where characters interact with their surroundings.

*Visual Elements:* Bright skies and open spaces indicate daytime settings.

### ***Indoor Scenes (Living Room and Domestic Areas)***

*Details:* Cozy and domestic interiors with sofas, curtains, and personal items.

Scenes of household chores also reflect an intimate, everyday environment.

*Purpose:* Provides insight into the personal lives of the characters and their day-to-day routines.

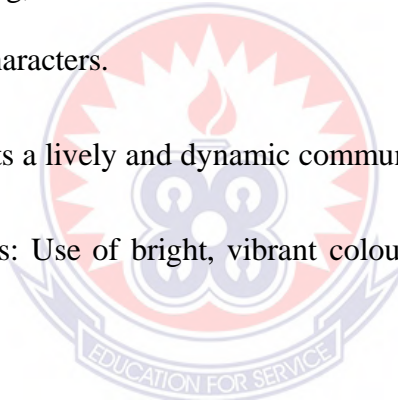
*Visual Elements:* Warm colour palettes and furniture arrangements indicate a sense of homeliness.

### ***Market Scenes***

*Details:* Bustling, colourful market stalls filled with activity and vibrant interactions between characters.

*Purpose:* Depicts a lively and dynamic community hub.

*Visual Elements:* Use of bright, vibrant colours for market items and human activity.



### ***Hospital Scenes***

*Details:* Ambulance parked outside, hospital beds, and waiting areas.

*Purpose:* Evokes emotions tied to care, vulnerability, and healing.

*Visual Elements:* Clinical and clean designs with subdued tones to reflect a formal, serious environment.

### ***Struggle/Reflection Scenes***

*Details:* Sparse, dimly lit personal spaces showing characters in moments of rest or struggle.

*Purpose:* Highlights isolation, challenges, or contemplative states of mind.

*Visual Elements:* Shadows and darker tones emphasize solitude or conflict.

### ***Mood Tones***

Optimistic and Vibrant

Seen in the outdoor and market scenes.

Bright lighting and cheerful colours create a lively and positive mood.

Symbolizes community, interaction, and activity.

Calm and Introspective

Evident in indoor settings like the living room.

Warm and neutral tones reflect comfort and personal space, creating a calm and contemplative mood.

Serious and Emotional

Present in hospital scenes.

The use of neutral, subdued tones conveys seriousness, care, and emotional gravity.

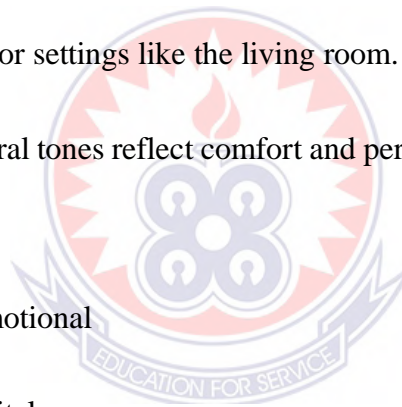
### **Highlights themes of health, healing, and vulnerability**

*Struggles and Challenges*

Reflected in scenes with darker lighting and sparse environments.

The use of shadows and muted tones sets a somber or tense mood.

Represents personal struggles, hardships, or moments of crisis.



These environment settings and mood tones collectively contribute to the storyboard's narrative, creating a balance of action, reflection, and emotion.

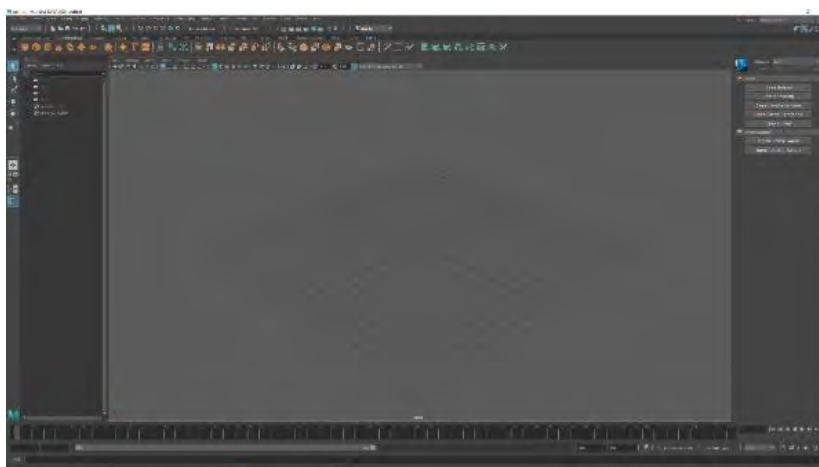
## 4.11 Production Process

### 4.11.1 Autodesk Maya

The researcher used Autodesk Maya to translate the storyboard into a 3D animation. The software's robust capabilities allowed for detailed modeling, texturing, rigging, animating, lighting, and rendering, ensuring the scenes were accurately represented in 3D. The figure below shows the interface of the Maya software



*Figure 33. Opening the Autodesk Maya 2022 Software*



*Figure 34. Interface of Autodesk Maya Software*

#### 4.11.2 Modeling Process

The researcher began the modeling process by creating the characters, props, and environment based on the storyboard sketches. Figures 35 and 36 show images of the modeling process.



Figure 35. Modeling of the house compound

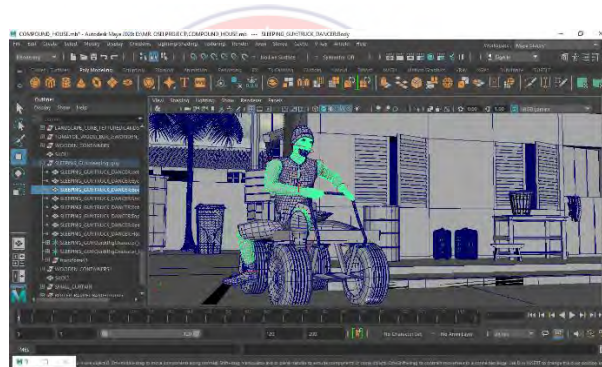


Figure 36. Modeling of a character in the community

*Step 1:* Using Maya's polygonal modeling tools, these shapes were refined to add detail and realism.

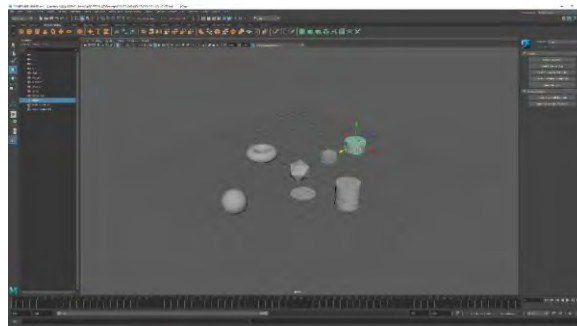
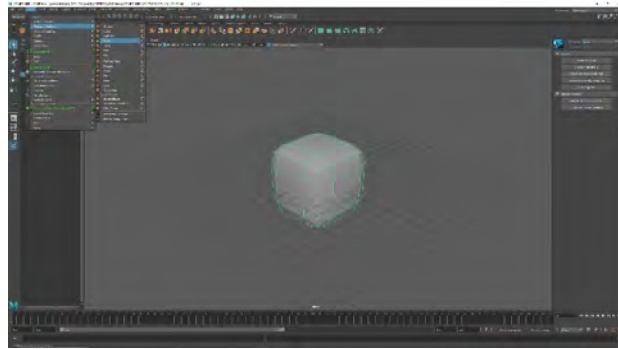


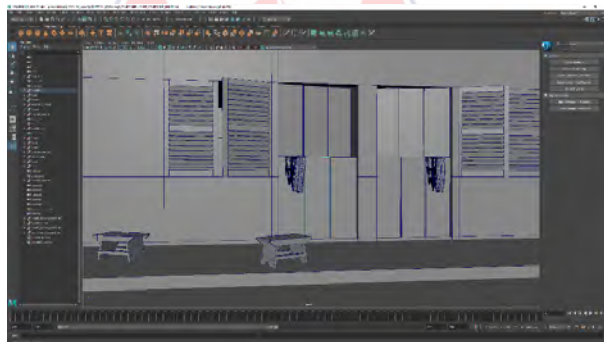
Figure 37. Some polygonal modeling tools found in the Autodesk Maya 3D Software used for modelling

*Step 2:* Basic geometric shapes were used as the foundation to create characters, objects, and buildings.



*Figure 38. Creating a geometric shape from the polygonal tools as the foundation to the modelling process*

*Step 3:* The settings, such as the living room, market, and hospital, were constructed by combining multiple objects into cohesive scenes.



*Figure 39. Multiple line construction used for the modelling*

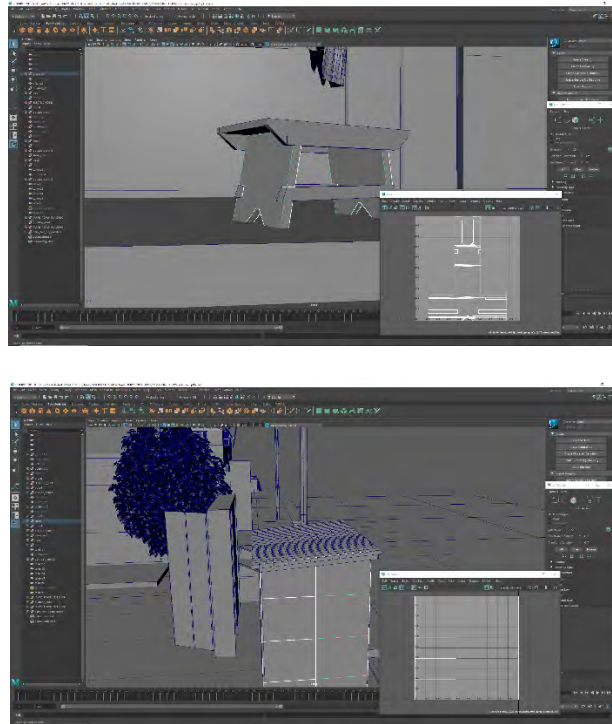
*Step 4:* The lines shown is depicted to review the multiple construction by combining the objects into cohesive scenes.

*Purpose:* This step ensured that all elements of the storyboard were translated into 3D with accurate proportions and details.

#### ***4.11.3 Texturing Process***

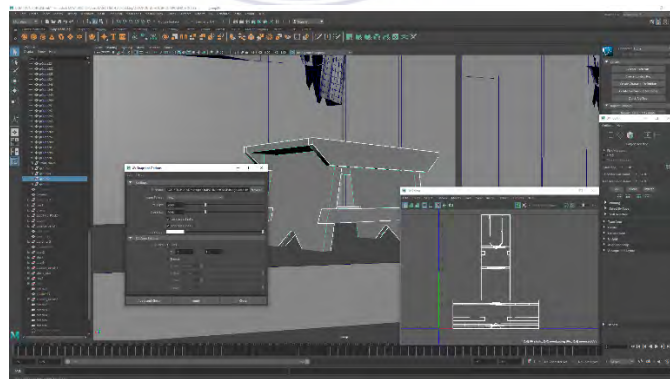
The researcher continued with texturing. Texturing added surface details and colours to the 3D models, bringing them closer to realism.

*Step 1:* UV unwrapping was performed to flatten the 3D models for proper texture mapping.



*Figure 40. UV unwrapping of some modelled objects in the scene*

*Step 2:* Textures, including fabric, skin, wood, and concrete, were created in external programs like Adobe Photoshop and imported into Maya.



*Figure 41. Exporting UV unwrapping from the Maya software to the Adobe Photoshop Software for the texture placement*

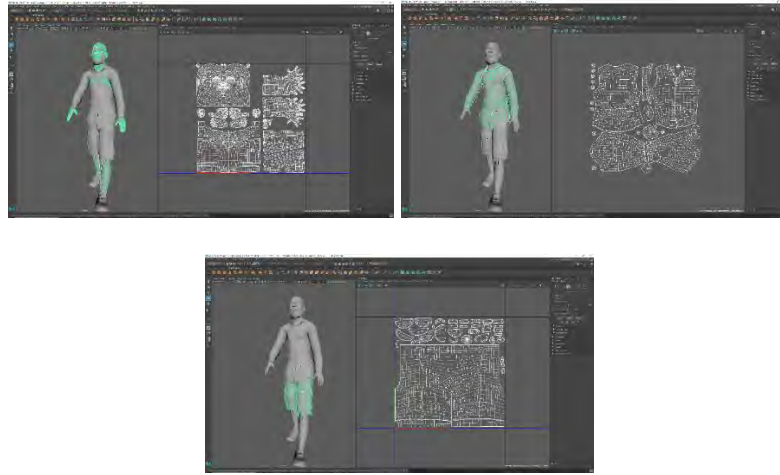


Figure 42. Character UV unwrapping export for the texture placement



Figure 43. Opening the Adobe Photoshop Software to accommodate the UV unwrapping export for the texture placement

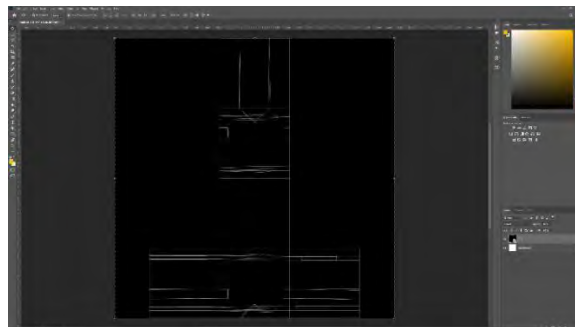


Figure 44. Working in the Adobe Photoshop Software for the texture placement on the unwrapped export



*Figure 45. Texture unwrapping placement for main Character model*

*Step 3:* These textures were applied to the models, with adjustments to their material properties, such as glossiness or roughness, using Maya's Hypershade editor.



*Figure 46. Texturing of the compound in Autodesk Maya*



*Figure 47. Texturing of props in the market*



*Figure 48. Texturing of the room*

*Purpose:* This step provided the visual richness and texture fidelity required for the storyboard scenes.

#### 4.11.4 Rigging Process

Rigging prepared the characters and objects for animation by adding a skeletal structure. The researcher carefully followed the steps below to rig all the characters.

*Step 1:* Skeleton rigs were created and placed inside the 3D models to simulate movement.

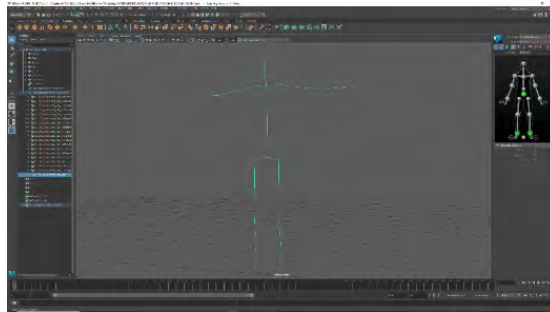


Figure 49. Creating Rigs for all characters

*Step 2:* Controls were added to the rigs, allowing animators to manipulate body parts easily.

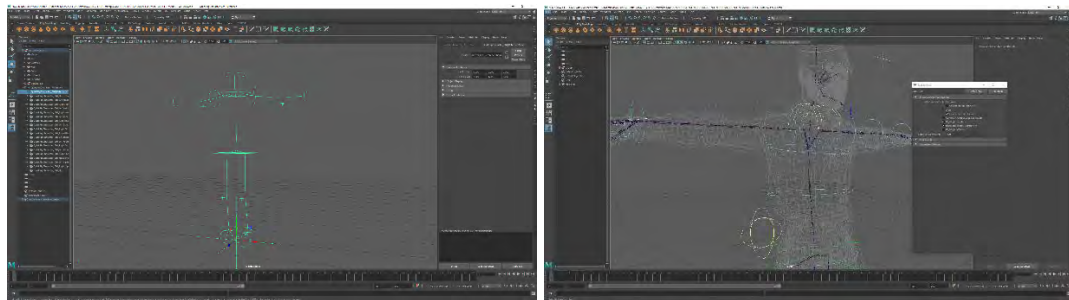
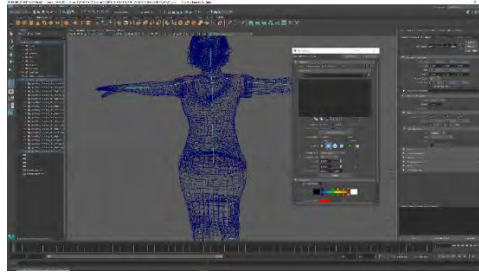


Figure 50. Setting controllers for the rigs created to aid Animation

*Step 3:* Weight painting was used to ensure smooth deformation of the characters during animation.

*Purpose:* This process ensured that characters and movable props were ready for dynamic motion and interaction.



*Figure 51. Skin weight painting the characters*

#### ***4.11.5 Animating Process***

Animation brought the storyboard scenes to life through motion and timing. At this stage of the process, the researcher followed through the steps below to create the animation.

*Step 1:* Keyframe animation was used to define the critical poses and movements for the characters and props.



*Figure 52. Animating the Character*

*Step 2:* Maya's graph editor was employed to adjust the timing and smooth transitions between poses.



*Figure 53. Using the Graph Editor for the Animation timing and smooth transitions between poses*

*Step 3:* Secondary animations, like facial expressions and environmental interactions, were added to enhance realism.



*Figure 54. Facial rig for setting the facial expressions*

*Purpose:* This step ensured that each scene in the storyboard was accurately depicted with lifelike movement and fluidity.

#### **4.11.6 Lighting Settings**

Lighting played a crucial role in creating the desired mood and atmosphere for each scene.

*Step 1:* Multiple light types, including directional lights for sunlight and spotlights for indoor settings, were placed strategically in the scenes.



*Figure 55. Directional light placement for interior room*

The directional light was placed from outside the window to cast the light inside the interior room scene, with an area light placed at the top to cast light down to feel the whole scene



*Figure 56. Skydome light for exterior and environment scenes*

Skydome light placed outside the scenes is to cast a sun view light in the scene with the texture placement of a day time HDRI sky and clouds

*Step 2:* Maya's Arnold renderer was used to adjust light intensity, shadows, and colour tones.

*Step 3:* Global illumination and ambient occlusion were enabled to add depth and realism to the lighting setup.

*Purpose:* Proper lighting enhanced the mood tones established in the storyboard and provided visual clarity.

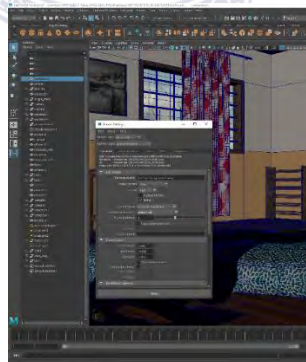
#### 4.11.7 Render Settings

Rendering finalized the scenes by producing high-quality images and animations.



*Figure 57. Some rendered images of the scenes in the project*

*Step 1:* Render settings, such as resolution, frame rate, and sampling quality, were configured in Maya's Arnold Renderer.



*Figure 58. Adjusting the render settings for the rendering*

*Step 2:* Batch rendering was used to generate frames for each scene, which were later compiled into the final animation.

*Step 3:* Post-processing tools were employed to adjust colour grading, add effects, and refine the output.

*Purpose:* This step ensured that the final output met professional standards in terms of visual quality and storytelling.

### ***Conclusion***

Through Autodesk Maya, the storyboard was successfully transformed into a visually compelling 3D animation. Each step, from modeling to rendering, adhered to the storyboard's visual and narrative goals, ensuring the animation captured the intended emotions, settings, and actions that interest the audiences.

## **4.12 Post-Production**

Post-production played a crucial role in finalizing the 3D animation and enhancing its visual quality to meet professional standards. Various software tools were utilized to refine the rendered image sequence, add effects, and ensure smooth delivery.

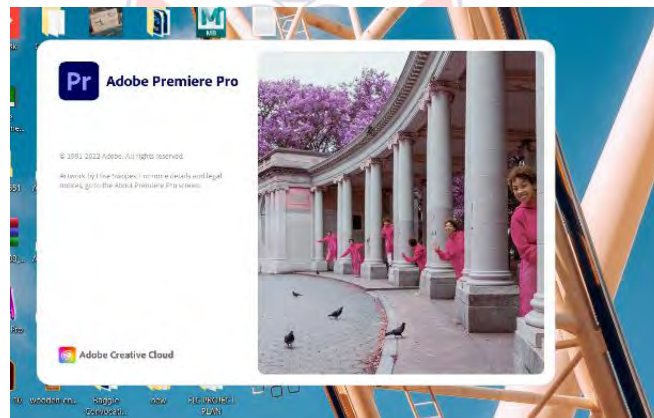


Figure 59. Opening Premiere Pro

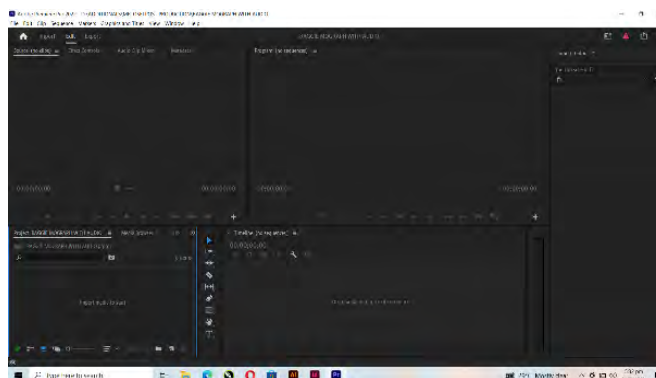


Figure 60. Premiere Pro interface

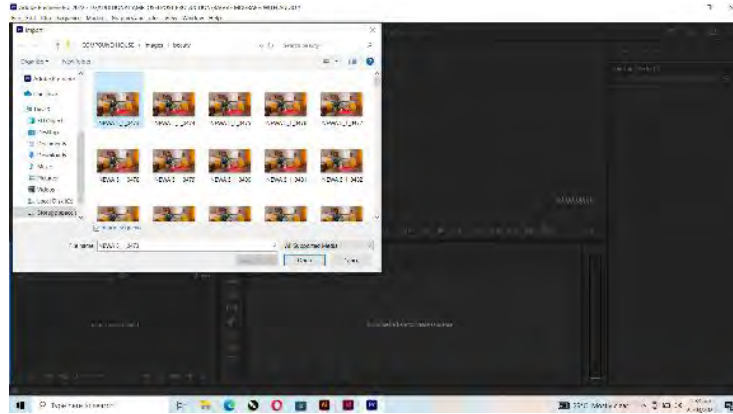


Figure 61. Importing the images to premiere Pro for the image sequence into video H.264



Figure 62. Editing in Premiere Pro



Figure 63. Colour Correction and Colour Grading in Premiere Pro



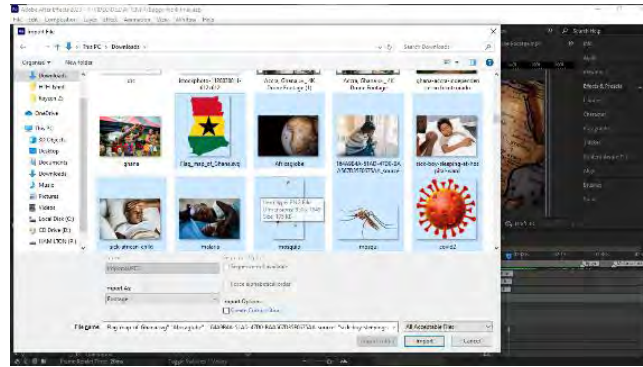
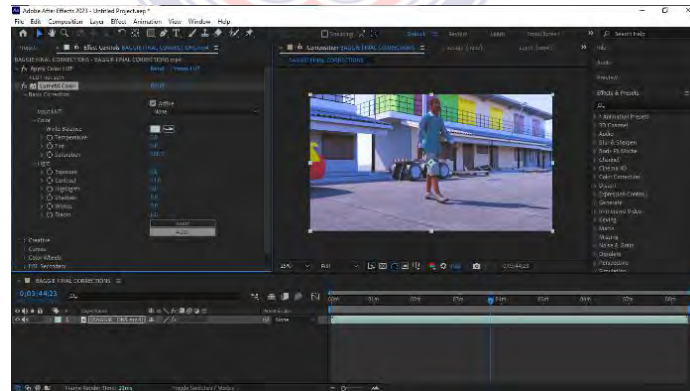


Figure 68. Importing the images for the motion graphics into After Effects



Figure 69. Imported Video into After Effects



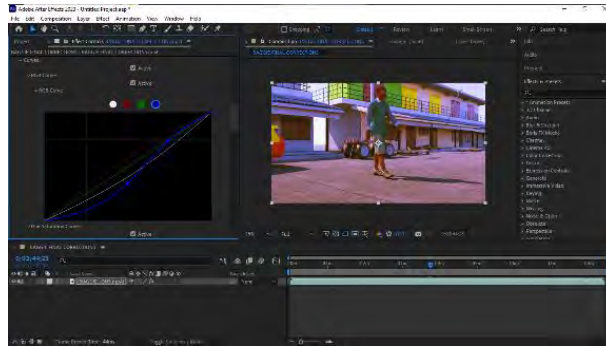


Figure 70. After Effects colour correction and colour grading

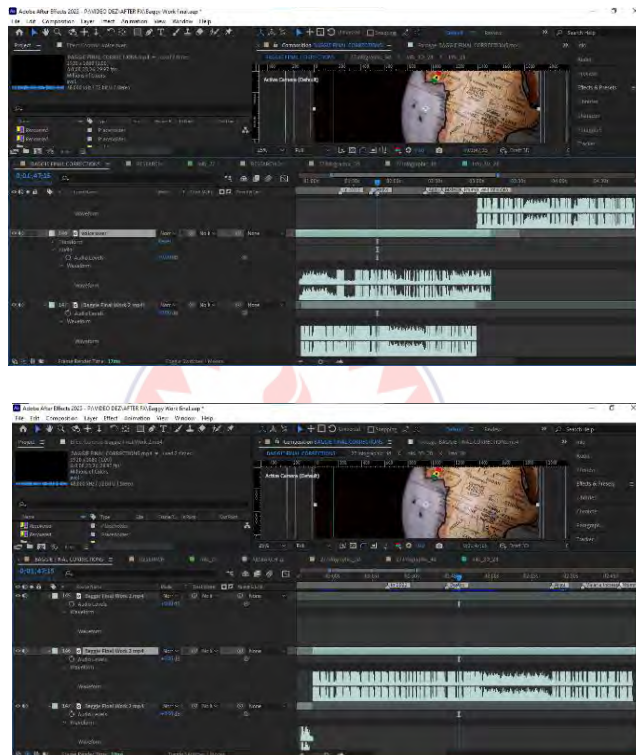
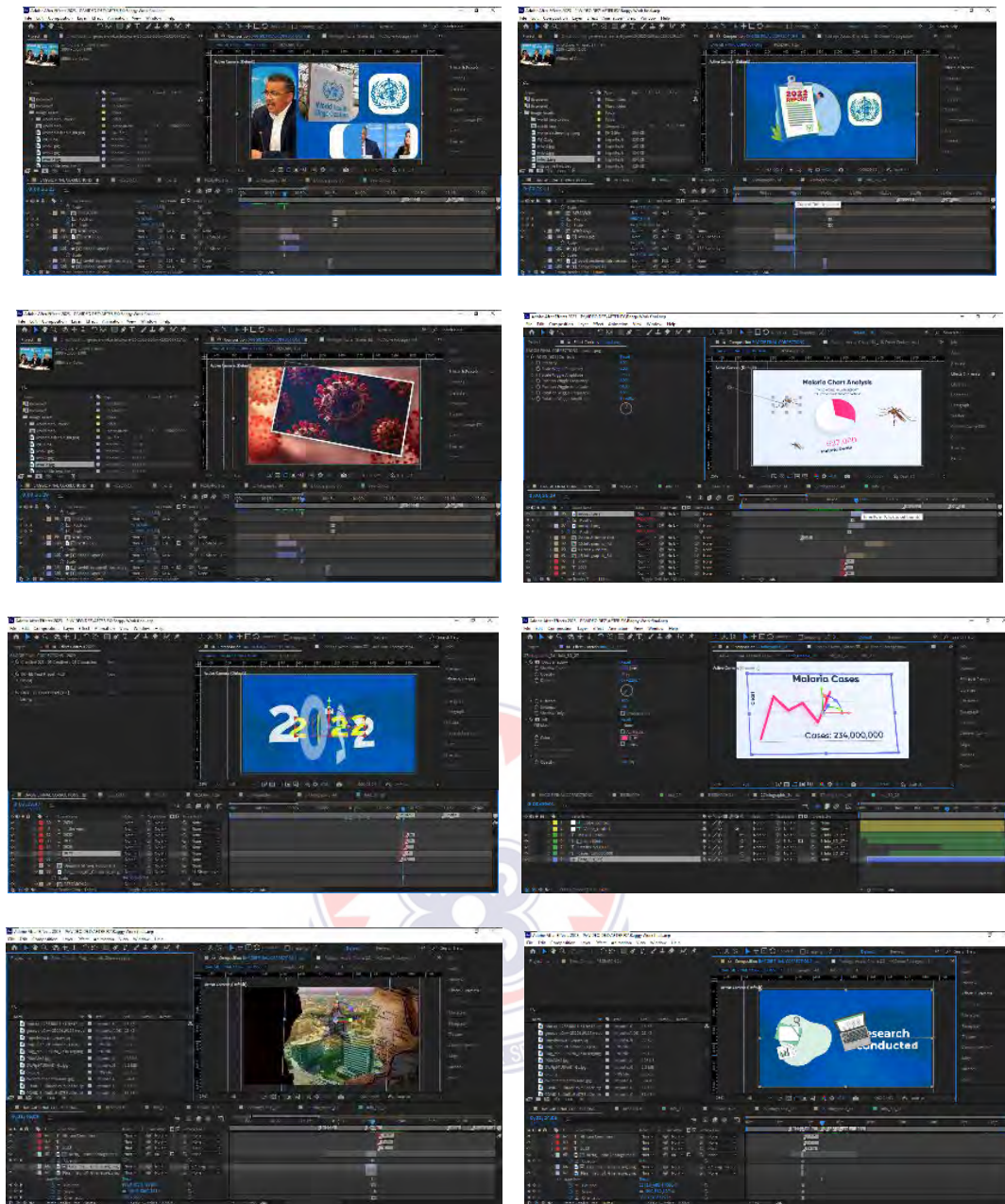


Figure 71. Adding the sound effects, music, and voice-over into After Effects



Figure 72. Beginning the first Motion Graphic Animation in After Effects for the  
Animated video



*Figure 73. Working and Creating, Correction and Changing the Motion Graphics in After Effects*

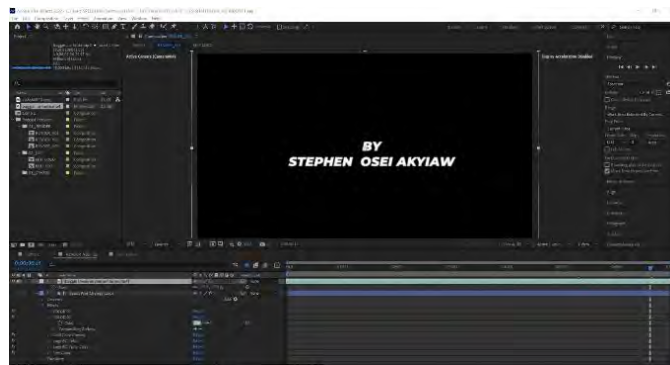


Figure 74. Finalizing the motion graphics in After Effects

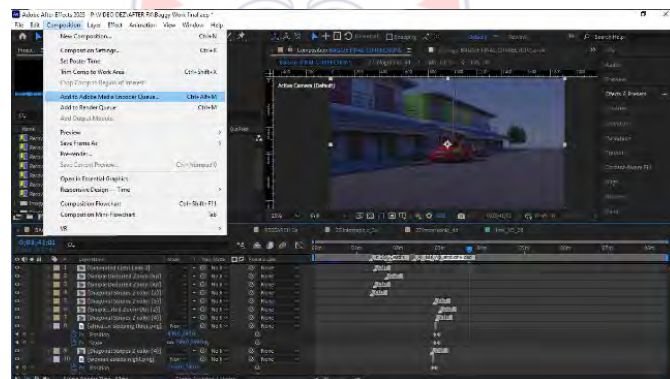


Figure 75. Exporting from After Effects to Media Encoder for rendering

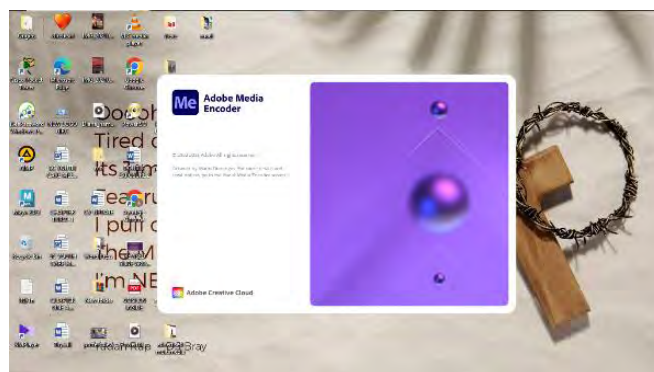


Figure 76. Opening Media Encoder

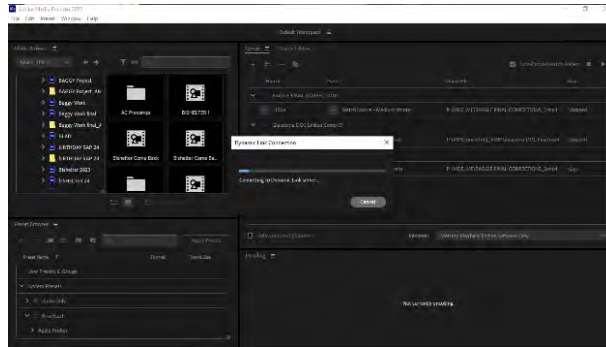


Figure 77. Connecting Media Encoder to After Effects through the dynamic link

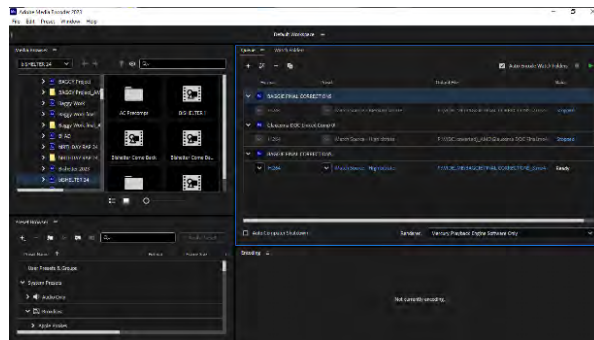


Figure 78. Loaded Export from After Effects into Media Encoder

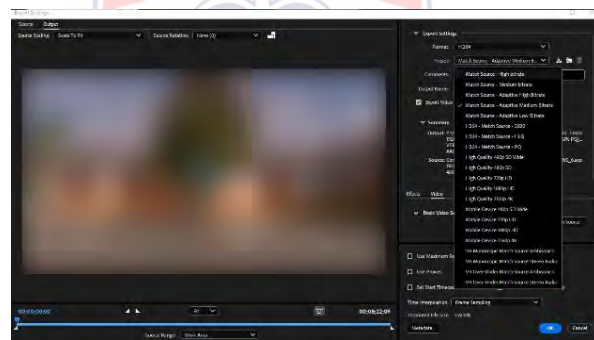


Figure 79. Media Encoder Export Settings

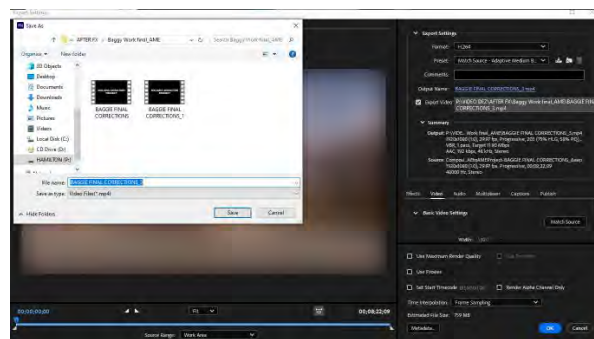


Figure 80. Setting export saving location from Media Encoder to a directory folder into the laptop

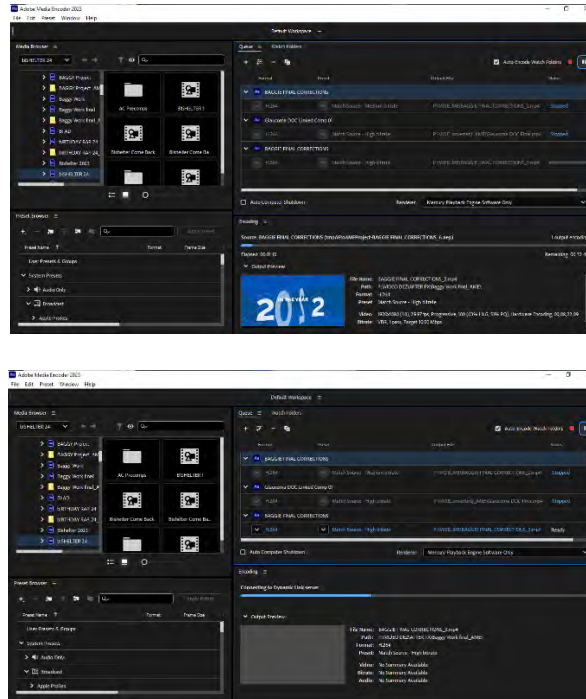


Figure 81. Exporting from Media Encoder

#### 4.12.1 Rendering and Initial Processing

The final renders were processed using Arnold Renderer, a tool renowned for its ability to simulate realistic lighting and materials. The rendered output served as the foundation for subsequent refinements. Arnold Renderer translated the 3D scenes into 2D animated frames, incorporating advanced light simulation for photorealistic results (Autodesk, 2024).

#### 4.12.2 Assembly and Animation Creation

Adobe Premiere Pro was used to compile the rendered image sequences into a cohesive animation. This process included precise colour correction and grading to optimise the H.264 video format for smooth playback and compatibility across platforms. The software's advanced editing features enabled seamless integration of visuals and ensured consistency in colour tones.

#### ***4.12.3 Special Effects and Motion Graphics***

Adobe After Effects was employed for the addition of professional-grade effects and advanced colour correction. The software also facilitated motion graphics, which were used to enhance the explanatory text accompanying the 3D animation. These effects served to provide contextual information and guide the viewer's understanding of the narrative and technical aspects of the animation.

#### ***4.12.4 Colour Grading and Final Touches***

Both Premiere Pro and After Effects were instrumental in achieving professional colour grading. This process refined the animation's overall aesthetic, enhancing the visual appeal while maintaining consistency with the project's artistic vision. The use of these tools ensured a polished final output, aligned with industry standards for 3D animated content.

#### ***4.12.5 Voice-Over Recording and Editing***

The preparation for the voice-over recording took about one (1) month to get it done. The voice-over artist was not available due to his time schedules. So, when we finally made the appointment, we had to finish it the same day. The recording was done within a period of five (5) hours. The voice-over recording was done in a soundproof studio in the Technology Block which is situated at the Central Campus of the University of Education, Winneba.



*Figure 82. Voice Over recording at the studio, Technology Block, UEW*

The recording followed the script and the storyboard. The languages recorded were Fanti and Effutu. The Shure microphone which is a solid sound equipment was used to record the voice. During the recording the researcher ensured that the tenets of the AIDA model and the Cognitive Theory of Multimedia Learning were adhered to. Knowing very well that the voice in the animation complements and completes it, the researcher ensured that the spoken language captured elements that would strike attention, interest and desire which led to action (postproduction). Presentation of the script in the storyboard orally laid emphasis on the interesting of the AIDA and also relied on recall, which is an aspect of the Cognitive Theory of Multimedia Learning to make the voice-over appealing and easily memorable to the viewers. The researcher guided the voice-over artist through all the scenes in the storyboard to ensure that the recording captured everything and also included the requirement of the theories used for the study.

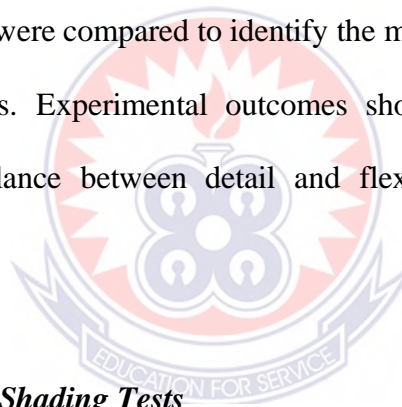
The researcher used both Cubase and Adobe Premier Pro to edit both recordings. The researcher used Cubase to edit the recording for the Effutu Language and later had to use Adobe Premiere Pro for the editing of the Fanti Language because the Cubase application corrupted the following day.

### **4.13 Project Experimentation**

The experimentation phase of the project was essential to test and refine the workflows, techniques, and tools used in the production of the 3D animation. This stage involved iterative testing, analysis, and adjustments to ensure that the final output aligned with the creative vision and met professional standards.

#### ***4.13.1 Modeling Experiments***

During the modeling phase, multiple iterations of the 3D assets were created by the researcher using Autodesk Maya to determine the best approach for balancing detail and rendering efficiency. Techniques such as polygonal modeling, subdivision surfaces, and NURBS were compared to identify the most suitable method for creating clean, detailed meshes. Experimental outcomes showed that polygonal modeling provided the best balance between detail and flexibility for complex structures (Autodesk, 2024).



#### ***4.13.2 Texturing and Shading Tests***

Various texturing workflows were tested to achieve realistic surface appearances. Tools like Adobe Substance Painter were used to experiment with procedural and hand-painted textures. Different material shaders in Arnold Renderer, including standard surface shaders, were analysed to simulate light reflection, transparency, and roughness.

Results indicated that using a combination of baked procedural maps and hand-painted textures provided the best results for maintaining realism while optimizing rendering times (Adobe, 2024).

#### ***4.13.3 Rigging Adjustments***

Recent rigging experiments were undertaken to assess the practical effectiveness of varied control rig designs for character animation. A significant focus within this evaluation was the direct comparison between Inverse Kinematics (IK) and Forward Kinematics (FK) setups. These were judged primarily on their responsiveness to animator manipulation and the overall ease they afforded during the animation process. Choosing between IK and FK isn't trivial; it fundamentally affects how an animator works, influencing both the speed of production and the organic quality of the resulting motion, making such comparisons vital (Parent, 2012).

In addition to examining these standard kinematic approaches, the experiments involved implementing custom control systems. These specialized rigs were designed to handle the complexities of facial expressions and the nuances of secondary motions, such as the subtle sway of clothing or antennae. As discussed in foundational animation literature (Parent, 2012), the rationale behind developing such custom interfaces is to grant animators increased flexibility for detailed performance articulation and to enhance efficiency by simplifying the control of otherwise intricate animation tasks.

#### ***4.13.4 Animation Refinement***

Animation tests involved creating keyframe animations to experiment with timing, spacing, and motion curves. Various interpolation techniques, including linear, spline, and stepped keys, were applied to observe their effects on motion fluidity. Motion capture data was incorporated in some experiments to evaluate its integration into hand-keyed animations. The blend of the two approaches achieved a balance between realism and creative exaggeration (Autodesk, 2024).

#### ***4.13.5 Lighting and Rendering Trials***

Lighting setups were tested extensively, using three-point lighting, HDRI environments, and area lights to experiment with shadow softness and realism.

Different rendering parameters in Arnold, such as sample rates and denoising settings, were adjusted to optimize render quality while reducing time.

The experiments revealed that HDRI lighting provided the most realistic environmental illumination, complemented by strategically placed area lights to enhance subject focus.

#### ***4.13.6 Post-Processing Tests***

Experimentation with Adobe After Effects involved testing various colour grading presets and motion graphics styles to find the best fit for the animation's theme.

Transitions and special effects, such as lens flares and particle effects, were adjusted based on audience feedback to enhance visual storytelling without overloading the scenes.

#### ***Conclusion***

The project experimentation phase provided critical insights into each stage of the production pipeline. It facilitated informed decisions on tools, techniques, and workflows, ensuring the final animation met both artistic and technical expectations.

#### **4.14 Iteration on the Project**

The iteration process was an integral part of the 3D animation project, involving repeated cycles of testing, evaluation, and refinement to enhance the quality of the final

outcome. Each stage of production underwent multiple revisions to address issues, optimize techniques, and align with the creative vision.

#### ***4.14.1 Iteration in Modeling***

During the modeling phase, initial designs were reviewed to ensure accuracy and visual appeal. Feedback led to the refinement of edge loops and topology, improving the models for animation and rendering. Issues with uneven mesh distribution were resolved by revisiting the subdivision levels and reworking the geometry to maintain clean edge flows. This stage underwent the topology process. Anatomy was also taken into consideration.

#### ***4.14.2 Iteration in Texturing***

Texturing iterations focused on enhancing material realism and detail. Multiple passes of texture painting were conducted using Adobe Photoshop, with adjustments made to the bump maps, colour palettes, and roughness levels based on test renders. An overly reflective surface brought from the application of texturing to the models was corrected by adjusting the material's roughness and specular properties, which significantly improved realism. UV mapping was exported from the Autodesk Maya software to the Adobe Photoshop software to achieve direct placements from the guides provided.

#### ***4.14.3 Rigging Refinements***

Iterations in rigging were crucial to achieving fluid and natural movements. Initial tests revealed limitations in joint flexibility and control rig responsiveness. As a result, additional controllers were added to the rig, and weight painting was refined to avoid deformation issues during animation. This process ensured that the character rigs could

support complex movements without compromising anatomical accuracy. The rigs were then binded to the models and with the application of weight painting to attach directly to the model to prevent any distortion.

#### ***4.14.4 Animation Adjustments***

Animation iterations focused on perfecting timing and movement. Feedback from preliminary tests highlighted areas where motion lacked fluidity or appeared exaggerated. By refining the keyframe timing and adjusting motion curves, smoother transitions and more realistic motions were achieved. The addition of secondary actions, such as subtle hand movements, further enhanced character expressiveness.

#### ***4.14.5 Lighting and Rendering Optimization***

The lighting and rendering phases involved multiple iterations to achieve optimal visual clarity and realism. Test renders revealed inconsistencies in shadow quality and colour balance, which were addressed by adjusting light placement and intensity. Additionally, rendering parameters, such as sample rates and denoising settings in Arnold, were fine-tuned to reduce noise while maintaining render efficiency. The lesser the values of the light exposure the darker the scene, the higher the values of the light exposure the brighter the scene but the delay in rendering time. Arnold produces realism and quality rendering but rendering time prolonged.

#### ***4.14.6 Post-Production Iteration***

Post-production iterations focused on fine-tuning visual effects and colour grading. Feedback from initial animation sequences led to adjustments in Adobe After Effects, where motion graphics, transitions, and colour correction were refined. For example,

oversaturated scenes were balanced by altering the hue and luminance, creating a more cohesive and visually pleasing final product.

### ***Conclusion***

The iterative process was pivotal in refining every aspect of the project, from modeling and rigging to texturing and rendering. Each cycle of revision incorporated feedback and technical adjustments, ensuring a polished final product that met both creative and technical objectives.



## **CHAPTER FIVE**

### **PRESENTATION OF FINDINGS AND DISCUSSIONS**

#### **5.0 Overview**

This chapter looks at the presentation and discussion of data received during pre-studio and post-studio research periods respectively. The pre-studio session considered the modes and processes used for communicating the preventive measures of Malaria, and the dominant visual communication materials available for communication during Malaria education in the selected health centres within the study's locations. For the post-studio research session, the study examined the health officers' perspectives and experiences about the use of animation during Malaria education, and how community dwellers interpreted the communication and persuasive elements of the animation. Large parts of the presentation of data were paraphrased, and to show the actual voices of the participants, direct quotations from participants were also presented. As part of the presentation of data, important visual images and shots of data collected visually in the study locations were also included. The interview questions were developed based on the research objectives of the study. Themes presented and discussed were developed based on the responses obtained during the interviews.

#### **5.1 Discussions of findings of Research Question One**

This section of the study discusses the findings of the pre-studio research. Data was collected through interviews and visual research.

**5.1.1 RQ1. What are the modes and channels used for communicating the preventive measures of Malaria, and the dominant visual communication materials available for communication during Malaria education in the selected health centres in the Effutu Municipality?**

This research question examined the pre-production phase of the study, investigating the modes, channels, and visual materials used for Malaria prevention education in selected health centers within the Effutu Municipality. The question encompassed several sub-questions that guided the inquiry. Through a comprehensive analysis of data collected via interviews, observations, and visual research, three dominant themes emerged from the coding process: Health Education Campaigns, Visual Communication Cues, and Indigenous Language. These themes represent recurring patterns identified in the transcript analysis and provide a framework for understanding the communication strategies employed in Malaria prevention efforts throughout the municipality. Each theme offers insights into different aspects of the communication ecosystem that health professionals have developed to address Malaria prevention in this specific cultural and geographical context.

**5.1.1 Health Education Campaigns**

Health Education Campaigns emerged as the first theme generated for the study. Health Education in the community serves as the primary means through which all health facilities selected for the study disseminate information to community members. Community health education fundamentally focuses on promoting, protecting, and improving the health of individuals within the communities. These community health education programs are designed with the explicit aim of preventing disease, promoting wellness, and enhancing the quality of life for community members.

The participants indicated that they organized health education initiatives in the communities through various channels: Home Visitations (face-to-face interactions), Health Talks at Community Information Centers and hospital premises, Community Radio Discussions, and Community Durbars. This multi-channel approach aligns with the first component of the AIDA model – Attention – as described by Ghirvu (2013), which emphasizes that advertisers must promote information in such a way that captures the target audience's attention and makes them aware of the message being communicated. This strategy also reflects Vakratsas and Ambler's (1999) assertion that capturing people's attention requires unique approaches, such as attention-grabbing visuals or presentations.

The personal testimonies from health workers further illuminate the various channels employed highlighting the use of centralized community venues for information dissemination.

*I together with my other colleagues give Malaria related precautions and prevention information to the community members at the community information centre usually. (V. Hannah, personal communication, July 19, 2023)*

B. Raymond described a more institutional approach:

*Most often I deliver Malaria education to the patients who come to the maternity at the space provided for education inside the hospital premises to be specific at the maternity area. (B. Raymond, personal communication, July 22, 2023)*

This approach takes advantage of captive audiences within healthcare settings, where individuals are already primed to receive health-related information. The multi-faceted approach to health education was further elaborated by R. Asiedu:

*“As a Public Health Nurse, I use the community information centre, house visitations and the hospital premises to educate patients on the preventive measures of Malaria. (R. Asiedu, personal communication, July 17, 2023)*

This comprehensive strategy demonstrates an understanding of the Interest stage of the AIDA model, where Dahlen, Lange and Smith (2010) suggest that interest can be achieved by providing information about features and benefits in various formats.

Specialized professionals focus their educational efforts on specific vulnerable populations, as evidenced by S. Sky's statement:

*As a midwife who is always at the maternity space, I share the causes and prevention of Malaria to the pregnant women and new mothers who visit the ward at the ward. (S. Sky, personal communication, July 17, 2023)*

This targeted approach acknowledges the particular susceptibility of pregnant women to Malaria's adverse effects, addressing the Desire component of the AIDA model by tailoring information to specific audience needs (Ghirvu, 2013).

The personalized nature of some interventions was emphasized by P. Amoako:

*I do home visitations which is face-to-face, the community information centre and the hospital spaces to give Malaria education to patients and the community folks. (P. Amoako, personal communication, July 22, 2023)*

This approach recognizes the value of direct, personalized communication in creating the desire for behaviour change, as suggested by the AIDA model's third component. The effectiveness of these approaches was confirmed by community members themselves. B. Effe acknowledged:

*They (Health Officers) usually come to my house to share information on Malaria with me and my family. (B. Effe, personal communication, July 20, 2023)*

This direct outreach exemplifies the active-processing assumption of Mayer's (2014) Cognitive Theory of Multimedia Learning, which posits that meaningful

learning involves engaging in appropriate cognitive processing. The face-to-face interaction allows for immediate questions and clarification, enhancing comprehension.

Similarly, T. Kyere reported:

*When I was pregnant, I was visiting the hospital often. So, the nurses tell us (patients) to take care of ourselves to prevent getting Malaria. (T. Kyere, personal communication, July 20, 2023)*

This account demonstrates how healthcare settings serve as opportune moments for education, when patients are particularly receptive to health messages, a strategy that aligns with Mayer's (2014) personalization principle which suggests that people learn better when multimedia presentations use conversational language in relevant contexts.

These varied responses collectively indicate that health professionals provide information on Malaria to the community through multiple channels: health education at Community Information Centers, house visitations (face-to-face interactions), and within health facility premises, either at maternity wards or Out-Patient Departments (OPDs). This multi-channel approach maximizes the likelihood of reaching various segments of the population with critical health information.

The findings strongly support Agyemang-Badu et al.'s (2023) recommendation that the government of Ghana should, as a matter of necessity, support Environmental Health Officers in organizing public health education and Malaria campaigns in communities through local information centers, television, radio, and other accessible media channels. This multi-faceted approach to health communication also reflects Mayer's (2001) multimedia principle, which asserts that learning is more effective when people learn with words and pictures rather than words alone, suggesting that incorporating visual elements into these education campaigns could further enhance their effectiveness.

Furthermore, these approaches align with the Cognitive Load Theory component of Mayer's framework, particularly regarding intrinsic load management. As van Merriënboer, Kirschner, and Kester (2003) suggest, presenting elements in a simple-to-complex order helps learners gradually understand complex information. The various modes of education from community centres to one-on-one home visits allow health educators to tailor their message complexity to the specific audience, potentially enhancing comprehension and retention of Malaria prevention information.

#### **5.1.1.2 Visual Communication Cues**

Visual cues represent powerful tools that effectively capture attention and convey meaningful context in communication. These cues exist as recognizable visual elements that represent typical actions or concepts. As an intrinsic component of human communication, visual cues engage the sensory cortex dedicated to human vision and convey information and meaning in ways that often transcend verbal explanation. The human brain processes these cues to help interpret the surrounding world, recognize objects and people, and identify emotions and body language. Visual communication cues can be executed through various strategies, including text instructions, size variations, colour distinctions, contrast elements, strategic placement on screens, unambiguous icons, or combinations of these elements.

This theme emerged from participants' responses regarding the mass media aids health officers employ during Malaria education campaigns. The diversity of visual communication tools revealed in these responses demonstrates an intuitive understanding of the principles articulated in Mayer's Cognitive Theory of Multimedia Learning, particularly the multimedia principle which suggests that people learn better from words and pictures than from words alone (Butcher, 2014). This principle

underscores the fundamental importance of visual elements in health communication strategies.

Q. Liam described a multi-modal approach to Malaria education:

*I use the radio, posters and brochure/leaflet to deliver information on Malaria. So, I speak and show them the posters and brochure/leaflet. (Q. Liam, personal communication, July 19, 2023)*

This approach effectively incorporates both auditory and visual channels, aligning with Mayer's dual-channels assumption which acknowledges that humans possess separate channels for processing verbal/auditory and visual/pictorial materials (Mayer, 2005). By engaging both channels simultaneously, this health educator maximizes the cognitive processing capabilities of community members, potentially enhancing their understanding and retention of Malaria prevention information.

The integration of traditional and contemporary communication tools was illustrated by P. Ampah.

*I sometimes go to the radio station, on other days, I use posters, leaflets and self-downloaded animated videos on my phone to educate the community members of the dangers of Malaria and how to prevent contracting the disease. (T. Ampah, personal communication, July 19, 2023)*

T. Ampah's inclusion of animated videos is particularly significant when considered through the lens of the animation principle discussed by Lowe and Schnotz (2014), which suggests that animations can be effective learning tools when their educational goals are clearly defined. The participant's deliberate selection of Malaria-specific animations demonstrates an understanding of this principle, using animation as a tool to make abstract concepts related to Malaria transmission and prevention more concrete and comprehensible.

Some responses revealed common patterns in visual communication strategies. W. Assey and S. Sky both mentioned using posters and brochures to provide Malaria education to the community. These traditional visual aids have endured as communication tools because they effectively incorporate principles of the AIDA model, particularly in capturing Attention through visual design elements and generating Interest through informative content (Ghirvu, 2013). Well-designed posters and brochures can effectively draw viewers in and maintain their engagement with critical health information.

V. Hannah demonstrated an understanding of the importance of reaching audiences through multiple channels:

*Aside using posters and going to the community information centre to provide information on the spread and preventive measures of Malaria, I also use images and videos on social media as well. (V. Hannah, personal communication, July 19, 2023)*

This comprehensive approach acknowledges the changing media consumption habits of community members and leverages social media platforms as additional channels for visual communication. The incorporation of social media content reflects an understanding of the "Interest" component of the AIDA model, wherein Dahlen, Lange and Smith (2010) suggest that interest can be achieved by providing information about features and benefits in formats that resonate with target audiences.

The effectiveness of visual materials in Malaria education was confirmed by community members themselves. Y. Sika recalled:

*I remember a nurse once brought a book (brochure) and showed me certain images and shared the preventive measures of Malaria with me. (Y. Sika, personal communication, July 18, 2023)*

This testimony underscores the memorability of visual communication, suggesting that the visual elements in the brochure created a lasting impression that

facilitated recall of the associated health information. This phenomenon can be understood through Mayer's framework, particularly the active-processing assumption which posits that meaningful learning involves engaging in cognitive processes that lead to mental representations (Mayer, 2005).

R. Asiedu described a blended approach to visual communication:

*I use social media in addition to the posters to educate patients on the preventive measures of Malaria when they visit the hospital or when I go to the homes of community members. (R. Asiedu, personal communication, July 17, 2023)*

This strategy demonstrates an understanding of the multiple representation principle articulated by Ainsworth (2014), which suggests that there are situations where multiple representations help people learn more effectively. By providing Malaria information across different visual formats, this health educator increases the likelihood that the message will be comprehended and retained by diverse audience members with varying learning preferences.

The radio emerges as another significant communication channel, as evidenced by E. Mensah's statement:

*I listen to the health officers at the community information centre, and another time I also listen to them on Radio Windy Bay. They were talking about Malaria preventive. (E. Mensah, personal communication, July 21, 2023)*

While radio is primarily an auditory medium, it serves as an important complement to visual communication strategies, addressing the cognitive theory's dual-channels assumption by engaging the auditory processing channel. Radio can be particularly effective in communities where literacy levels may vary, ensuring that critical health information reaches all community members regardless of literacy status.

The integration of demonstration with visual aids was highlighted by A. Bambi:

*I use the posters displayed in the hospital and other physical materials available to educate the patients who visit maternity. The mosquito nets there are shared to the patients. We also use some for demonstration to show the patients who to use them. (A. Bambi, personal communication, July 20, 2023)*

This approach exemplifies the worked examples principle described by Renkl (2014), which suggests that in the first stages of skill learning, people learn better when they are given practical examples. By demonstrating the proper use of mosquito nets alongside visual materials, this health educator creates a comprehensive learning experience that addresses both the cognitive and practical aspects of Malaria prevention.



*Figure 83. Mosquito nets in the hospital*

*Source: Researcher's fieldwork, 2024*

The photograph of mosquito nets in the hospital, included as documentation by the researcher, serves as tangible evidence of the visual and physical tools employed in Malaria education. These nets represent not only a prevention method but also an educational tool that bridges the gap between abstract health information and concrete preventive action. This approach addresses the "Action" component of the AIDA

model, wherein Ghirvu (2013) suggests that effective communication should motivate audiences to take specific actions – in this case, the proper use of mosquito nets to prevent Malaria transmission.

The responses presented above clearly indicate that health officers at the selected facilities utilise a diverse array of communication tools such as radio, posters, brochures/leaflets, animated videos and social media content to disseminate information about the spread and prevention of Malaria to community members. These findings affirm aspects of Sokey and Adisah-Atta's (2017) research, which identified posters, healthcare providers, and families/friends as common sources of health information in rural communities, with radio being the most utilised medium. This consistency across research findings suggests that these communication channels have established credibility and reach within rural communities.

The combination of auditory and visual communication channels employed by these health educators aligns with the split-attention principle articulated by Ayres and Sweller (2014), which suggests that when words and images are physically and temporally integrated, individuals learn more effectively. By coordinating radio messages with visual materials, health educators create a more cohesive learning experience for community members.

The prevalent use of visual communication tools also reflects an understanding of the signaling principle described by Mayer and Fiorella (2014), which suggests that people learn more effectively when cues emphasising the organisation of crucial information are introduced. Visual elements in posters, brochures, and videos can serve as these cues, highlighting key information about Malaria transmission and prevention strategies.

These responses, coupled with the literature reviewed in the statement of the problem, informed the researcher's decision to develop an indigenous animation that could complement existing mass media aids for Malaria education. This decision demonstrates an appreciation for the animation principle outlined by Lowe and Schnotz (2014), which suggests that animations can be particularly effective when their educational goals are clear and well-defined. By creating an animation specifically designed for Malaria education in the local context, the researcher aims to harness the cognitive benefits of animated visual communication while ensuring cultural relevance and accessibility.

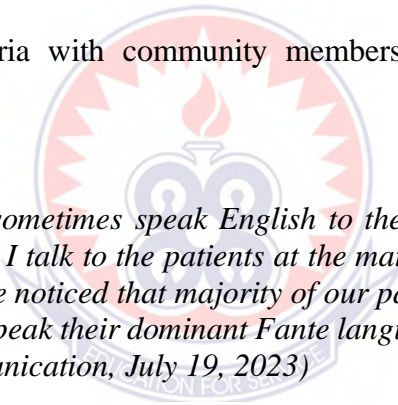
Furthermore, this approach acknowledges the personalisation principles articulated by Mayer (2014), which suggest that people learn better when multimedia presentations use conversational language, human voices, and culturally relevant elements. An indigenous animation can incorporate these elements, potentially enhancing its effectiveness as a health education tool in the specific cultural context of the Effutu Municipality.

By developing an animation that builds upon existing communication strategies while addressing potential gaps in visual representation, the researcher demonstrates an understanding of the complex interplay between cognitive processing, cultural relevance, and health communication efficacy. This approach has the potential to enhance Malaria education efforts by creating a multimedia learning experience that engages multiple cognitive channels, respects local knowledge and practices, and motivates preventive action among community members.

### 5.1.1.3 Indigenous Language in Malaria Communication

The study investigated the languages employed by health officers when communicating about Malaria prevention and spread to patients and community members in the Effutu Municipality. A definitive consensus emerged revealing the predominance of the Fante language, which functions as the principal language throughout Ghana's Central Region. The responses demonstrated that Fante is the most widely understood and commonly spoken language among both healthcare professionals and community residents.

This language preference was unanimously confirmed by all ten health officers participating in the study, who reported using Fante alongside Effutu, Twi, and English when discussing Malaria with community members and patients. As one health professional articulated:



*Even though I sometimes speak English to the patients, I often speak Fante whenever I talk to the patients at the maternity ward on Malaria because we have noticed that majority of our patients are the indigenes or people who speak their dominant Fante language fluently. (W. Assey, personal communication, July 19, 2023)*

This strategic language selection reflects a deep understanding of the cognitive processing mechanisms described in Mayer's Cognitive Theory of Multimedia Learning (CTML). According to Mayer (2014), information is first received through sensory memory – specifically through the auditory channel when processing spoken language. When health professionals select a language that patients comprehend fluently, they are optimizing the initial information intake stage, ensuring that patients can effectively process the verbal information through their auditory channel without unnecessary cognitive strain.

Another participant emphasized the contextual nature of language selection:

*I speak Fante and/or Effutu depending on the location I am giving education on Malaria. The location will make me know the preferred language suitable for the audience. (S. Sky, personal communication, July 17, 2023)*

This adaptive approach to language selection demonstrates an intuitive application of the personalization principle within the CTML framework. Mayer (2014) argues that people learn better when multimedia presentations use conversational language rather than formal language. By selecting indigenous languages like Fante and Effutu that community members use in their everyday conversations, health professionals are implicitly applying this principle, making the information more accessible and personally relevant to recipients.

Furthermore, this contextual language selection addresses the limited-channels assumption of CTML. Mayer (2005) postulates that each processing channel can handle only a small amount of material at a time. When information is presented in an unfamiliar language, considerable working memory resources must be allocated to basic language processing, leaving fewer cognitive resources available for comprehending the actual health message. By using Fante, health professionals reduce this extraneous cognitive load, allowing recipients to dedicate more working memory capacity to understanding the critical Malaria prevention information rather than struggling with language comprehension.

Community members validated the health officers' accounts, confirming that Fante was the primary language used during Malaria education sessions across various communication channels. As one community member noted:

*I was waiting for my card at the OPD when one of the nurses came to talk to us on the spread of Malaria. She spoke Fante and English that day. (A. Bambi, personal communication, July 20, 2023)*

This multilingual approach, while common, presents interesting implications when considered through the split-attention principle of CTML. Ayres and Sweller (2014) suggest that when multiple sources of information are physically and temporally integrated, individuals learn more effectively. In the context of language use, this might suggest that consistently using a single language throughout a health education session would be more effective than switching between languages. However, another community member's comment reveals the complexity of this issue:

*I think I have heard them speaking in Fante, Effutu and Twi. I do not understand the Effutu so I prefer the Fante. (E. Tetteh, personal communication, July 18, 2023)*

This preference highlights how individual differences in language proficiency interact with the principles of multimedia learning. While CTML generally applies to all learners, the specific language barrier described by E. Tetteh represents a form of intrinsic cognitive load that varies between individuals. As Sweller (2010) explains, intrinsic cognitive load is determined by the inherent complexity of the material and the prior knowledge of the learner, in this case, their language proficiency. For this participant, receiving information in Effutu would create an unnecessarily high intrinsic load, making Fante the more cognitively accessible option.

Another community member provided additional context about language use in healthcare settings:

*At the hospital, the nurses use Fante, Effutu or English languages to provide information on Malaria. (O. Nindow, personal communication, July 21, 2023)*

The multilingual environment described here can be analysed through the signaling principle of CTML. Mayer and Fiorella (2014) propose that people learn more effectively when cues emphasize the organization of essential information. When healthcare providers switch between languages, they must be careful to provide appropriate linguistic signaling such as clear transitions, repeated key points in multiple languages, or explicit acknowledgment of language switches to maintain the coherence of the health message across different linguistic presentations.

The importance of appropriate language selection also connects to the active-processing assumption of CTML. Mayer (2005) emphasizes that meaningful learning involves engaging in appropriate cognitive processing during learning. When information is presented in a language that recipients understand well, they can more readily engage in the essential cognitive processes of selecting relevant information, organizing it into coherent mental representations, and integrating it with their existing knowledge about Malaria and health practices.

This linguistic consideration becomes particularly significant when viewed through the lens of the working memory limitations described in Atkinson and Shiffrin's (1968) model, which Mayer incorporates into CTML. According to this model, the working memory has a limited capacity of approximately 5-9 items and information remains there for only about 30 seconds. When health information is presented in an unfamiliar language, much of this limited capacity is consumed by basic language processing, leaving insufficient resources for comprehending and retaining the health message itself.

The multimedia principle of CTML further illuminates why language selection is just one component of effective health communication. Butcher (2014) emphasizes

that people learn better from words and pictures than from words alone. While appropriate language selection optimizes the verbal channel of information processing, the interview data suggests that health professionals might further enhance their communication effectiveness by consistently pairing their verbal explanations with visual aids, regardless of the language used.

The guided discovery principle (de Jong & Lazonder, 2014) also has implications for language use in health education. This principle suggests that people learn better when guidance is incorporated into discovery-based multimedia environments. In the context of Malaria education, this might involve not just translating information into Fante or other local languages, but also structuring the information to guide recipients toward key insights about Malaria prevention in a way that accommodates their existing linguistic and cultural frameworks.

Understanding these cognitive dimensions of language use influenced the development of the animation under review in this study. By attending to the linguistic preferences of the target audience and applying relevant CTML principles, the animation aimed to minimize extraneous cognitive load while maximizing germane cognitive load which improved the productive mental effort that contributes to learning (Paas & Sweller, 2014).

These findings align with previous research by Sokey and Adisah-Atta (2017), who discovered that a significant portion of their study participants encountered difficulties accessing health information due to language barriers. In the context of the AIDA model, language serves as a foundational element for capturing attention and generating interest. As Dahlen, Lange, and Smith (2010) note, interest can be achieved by providing information about features, benefits, and unique selling propositions – in

this case, the benefits of Malaria prevention behaviours. However, these benefits can only be effectively communicated when presented in a language that recipients can comprehend with minimal cognitive effort.

The integration of local languages in health communication also supports the desire and action components of the AIDA model. Ghirvu (2013) explains that multimedia elements can increase desire by incorporating visual, audio, and textual elements that resonate with the audience. When these elements are presented in familiar languages like Fante, they are more likely to evoke the emotional engagement necessary to develop desire and ultimately motivate preventive action against Malaria.

## **Conclusion**

The exploration of Health Education Campaigns, Visual Communication Cues, and Indigenous Language use in Malaria prevention education within the Effutu Municipality reveals a comprehensive, multi-faceted approach that addresses the complex challenges of disease prevention in rural communities. All responses regarding these themes clearly indicate that health professionals educate patients and community members through verbal, nonverbal, and visual communication modes and channels, creating a health communication ecosystem where these elements work in concert to overcome barriers to effective Malaria prevention.

As Birt (2023) asserts, in-person conversations represent one of the most effective communication channels, allowing the integration of both verbal and nonverbal cues that enhance the quality and efficacy of information sharing. In employing face-to-face interaction for Malaria education, community members establish meaningful connections with healthcare providers. According to Ekman, Friesen, and Hager (2002), the human face produces thousands of distinct expressions

representing hundreds of emotional states, and these expressions have immediate impact on communication effectiveness.

Complementing verbal approaches, visual communication which Kapur (2020) identifies as a common form of daily communication delivered through platforms including radio, television, social networking sites, and other media engages multiple cognitive processing channels. The health officers' strategic use of multiple channels, visual tools, and indigenous languages aligns precisely with both the AIDA model and the Cognitive Theory of Multimedia Learning, creating synergistic effects that enhance comprehension, retention, and application of Malaria prevention knowledge.

The deliberate integration of indigenous languages, particularly Fante, represents a sophisticated application of cognitive learning principles that fundamentally enhances communication effectiveness by reducing extraneous cognitive load and optimizing information processing. As Malaria continues to pose significant public health challenges in the region, these communication strategies respecting cognitive limitations, engaging multiple sensory channels, and presenting information in accessible, culturally relevant formats serve as vital tools in the ongoing effort to reduce disease burden through improved prevention practices.

The development of indigenous animation represents a natural evolution of these existing strategies, building upon their strengths while addressing potential gaps in cultural relevance and visual representation. This deliberate integration of theoretical principles from communication and cognitive learning with practical, community-based approaches demonstrates a sophisticated understanding of how health information can be effectively disseminated in ways that not only inform but also motivate and empower communities to take preventive action against Malaria.

## 5.2 Discussions of findings of Research Question Two

This section of the study discusses the findings of the pre-studio research, pre-production and production stages of the research. Data was collected through interviews and visual research.

### 5.2.1 RQ. 2. What persuasive elements were integrated into the newly developed Malaria education animation to promote the prevention of Malaria in Effutu Communities?

The processes and steps for the development of the animation have been well outlined and explained in the preceding chapter (Chapter Four). This section takes care of the responses from the participants on what the core objective of the animation should be and how Malaria is prevented. The animation lasted for eight (8) minutes twenty-two (22) seconds.

These responses were necessary to shape the main concept of the animation and also confirm the knowledge of the community members with respect to the causes and prevention of Malaria in the community.

*The causes of Malaria should be prioritised as the central message for the animation. This will make the community folks to know how to protect themselves. (B. Raymond, personal communication, July 22, 2023)*

*The core message to be used for the animation must capture the causes and preventive measures of Malaria. (P. Amoako, personal communication, July 22, 2023)*

B. Raymond and P. Amoako made similar suggestions. They both suggested that the causes and preventive measures of Malaria should be the core message to reduce mortality and mobility. According to the participants, it is necessary because, it

will help the community members to protect themselves from the Malaria parasite and eliminate Malaria from the community.

Another participant (P. Ampah) said that

*The central objective should be Malaria Pathophysiology, for the people to know the need for the prevention. (P. Ampah, personal communication, July 19, 2023)*

R. Joy said that cleanliness in the environment should be the core message in the animation. S. Sky shared a similar concern as R. Joy but further emphasised that Malaria is deadly, for that, the matter cleanliness can help reduce deaths caused by the Malaria parasite. This confirms the assertion by WHO (2022) that Malaria is a deadly disease. WHO (2022) further states that 90% of death in Africa are caused by Malaria.

Q. Liam said that the avoidance of sleeping under insecticidal treated net (ITN) should be stress in the animation. W. Assey also said that “the ITN and its importance has to appear in the animation”. According to V. Hannah, the ITN is very good so the animation must display it well for the viewers to see it and appreciate its importance

W. Assey, Q. Laim and V. Hannah all affirms that sleeping under insecticidal treated net should be considered in the animation because it is very effective in preventing Malaria (Agyemang-Badu et al., 2023; Boateng et al., 2021). V. Hannah further stated that pregnant women are to take SP (Sufadoxine pyrimethamine) after quickening.

From the above response, it was evident that the participants preferred the core objective of the animation to be the causes and preventive measures of Malaria in the environment. Participants, including health officers and community members, shared insights on the communication strategies used in educating individuals about the spread and prevention of Malaria in Ghana. The study revealed that the Fante Language was predominantly used by health officers due to its familiarity and understanding among

both health workers and community members. Visual cues, such as posters, brochures, animated videos, and social media images, were also employed to enhance communication during Malaria education campaigns.

Health officers engaged in various methods to disseminate information, including community durbars, home visitations, and radio discussions. Public Health Nurses played a crucial role in educating patients, particularly in maternity wards, through face-to-face interactions and community information centers. The use of indigenous languages and visual communication cues were emphasised as effective means to bridge language barriers and enhance understanding among diverse populations.

Overall, the study highlighted the importance of tailored communication strategies in health education campaigns, emphasizing the significance of language proficiency and visual aids in conveying vital information about Malaria prevention and control within communities in Ghana.

In making the animation persuasive, the researcher had to fall on the rich experiences of the two (2) animation experts to guide the development of the animation. Findings from the interactions with the animation experts revealed three (3) very important items the development of the animation must capture. The items emphasised were employing familiar environment and names, humorous statements and original local tunes.

#### **5.2.1.1 Familiar Environment and Names**

The animation successfully creates a strong connection with its target audience by grounding the narrative in recognisable local contexts. By naming the protagonist

"Nenyi," a term of respect for older males in Effutu culture, the animation immediately signals cultural authenticity and relevance. One of the experts said:

*When creating health interventions for specific communities, you must reflect their lived experiences. I strongly recommend using culturally significant names like Nana ('Nenyi') for your main character. This immediately establishes cultural relevance and creates an emotional connection. Your viewers will not see this as just another health message, they will recognise this character as someone from their community. (T. Rockson, personal communication, October 10, 2023)*

This naming choice is deliberate, it creates an immediate sense of familiarity for viewers from the community while simultaneously establishing the character as respected elder whose subsequent poor health choices serve as a powerful cautionary tale. The physical environments depicted in the animation reinforce this cultural grounding. The precise replication of the Trauma and Specialist Hospital at Winneba, including specific details of the OPD such as "painting, chairs, floor everything," transforms an abstract health facility into a concrete location instantly recognisable to local viewers. The other said:

*Do not use generic settings. I would advise you to meticulously recreate actual local environments like the hospitals you are using for the study (The Trauma and Specialist Hospital) at Winneba. Take photographs of the hospital, the entrance, the exact colour of the walls, the arrangement of chairs in the OPD. When your audience sees these familiar details, the message becomes immediately relevant to their lives. This is not happening somewhere else, it is happening in their hospital, their market, their community. (M. Milly, personal communication, October 26, 2023)*

This visual specificity aligns perfectly with Mayer's (2014) Cognitive Theory of Multimedia Learning, particularly the "active-processing assumption" which states that meaningful learning involves engaging in appropriate cognitive processing during learning. By presenting familiar environments, the animation activates the viewers'

prior knowledge, allowing them to more effectively process and integrate new information. As Paivio (1986) and Plass, Chun, Mayer, and Leutner (1998) suggest, learners can create integrated mental models that increase the likelihood that information will be remembered when it connects to existing knowledge frameworks. The representation of everyday scenarios like the market with its uncovered gutters filled with rotten tomatoes reflects the lived reality of the target audience, creating what Baddeley (2003) would recognise as powerful connections to long-term memory storage, making the health message more accessible and memorable.

### 5.2.1.2 Humorous Statements

The strategic deployment of humour throughout the animation, particularly in the voice-over narration, represents a sophisticated approach to health communication that avoids the pitfalls of heavy-handed moralising. The concluding narration that addresses Nenyi's fate employs irony in noting that "although Nenyi is boastful and arrogant he did not sleep in a mosquito net," creating a moment of unexpected levity in what would otherwise be a somber conclusion. It was suggested by one of the experts who said:

*Avoid being didactic in your messaging. My recommendation is to incorporate humour in the voice-over, particularly around Nenyi's boastfulness and how it contrasts with his poor health choices. Our research shows that gentle mockery of stubbornness resonates deeply with Ghanaian audiences. Consider ending with something ironic about how despite his pride, Malaria still defeated him. This approach will make your message more memorable than a straightforward warning. (M. Milly, personal communication, October 26, 2023)*

This humorous framing of the consequence that "after he was boastful, Malaria killed him and condemned him" delivered in a "hilarious tone," transforms what could be perceived as preachy health advice into entertainment. The effectiveness of this approach finds theoretical support in Mayer and Moreno's (1996) stipulation that people

learn better when both channels are engaged in productive cognitive activities. The humour engages the emotional processing system while simultaneously delivering factual health information, creating what Sweller, Van Merriënboer, and Paas (1998) would identify as effective germane cognitive load which is a mental effort that directly contributes to learning. This is what the second animation expert said:

*If you want behaviour change, humour is your most powerful tool. I have found that when audiences laugh at a character's poor choices, they are more receptive to the underlying message. I would suggest making the voice-over commentary at the end both cautionary and funny. Perhaps noting how Nenyi's pride did not protect him from mosquitoes. When viewers laugh, they lower their defenses, and that's when the health message truly penetrates. (T. Rockson, personal communication, October 10, 2023)*

This approach cleverly addresses what Sweller (2010) defines as extraneous cognitive load. This is an unnecessary mental processing that can interfere with learning. By using humour, the animation reduces resistance that might otherwise create extraneous load, freeing up cognitive resources for processing the core health message. The humorous elements also serve what Mayer and Fiorella (2014) describe in the "personalisation principle," creating a conversational rather than formal tone that enhances learning outcomes by making the content more relatable and engaging.

### **5.2.1.3 Original Local Tunes**

The animation's incorporation of "local, similar to local Effutu songs" as background music and the Fante language for voice-over narration represents a sophisticated understanding of how cultural auditory elements can enhance message reception and retention. These sonic choices serve multiple persuasive functions simultaneously.

*Music is not just background; it's a persuasive element in itself. For your animation, I would strongly recommend using authentic local (Effutu)*

*rhythms and melodies. During our community testing, we've seen engagement levels dramatically increase when familiar musical patterns are incorporated. The music creates an emotional connection that makes viewers more receptive to health information. (T. Rockson, personal communication, October 10, 2023)*

The familiar musical patterns of Effutu songs trigger immediate cultural recognition, creating an emotional resonance that purely informational content cannot achieve. This musical familiarity establishes what Atkinson and Shiffrin (1968) would recognise as powerful sensory registers, the first stage in their Multi-Store Model of memory (MSM). According to their model, information from the senses is first stored in the sensory register, and while it is typically only retained for about half a second, attention to culturally significant sounds can facilitate transfer to short-term memory and eventually to long-term memory. Expert one also said:

*Language choice is crucial for your animation's success. My advice would be to use Fante for all narration rather than English. When health messages come in the mother tongue, they're received as advice from within the community rather than instructions from outside authorities. Our data shows significantly higher retention of key prevention points when delivered in local languages compared to English, even among bilingual viewers. (M. Milly, personal communication, October 26, 2023)*

This language choice aligns with Mayer's (2014) "personalisation, voice, embodiment, and image principles," which state that people learn better when multimedia presentations use conversational language and familiar human voices rather than formal language or voices with foreign accents. The use of Fante reduces what van Merriënboer and Sweller (2005) would identify as extraneous cognitive load, a mental effort that does not contribute to learning by eliminating the need for mental translation and allowing direct processing of the health information.

The combination of recognisable musical patterns and native language creates what Ibrahim (2011) would describe as optimal germane load, the cognitive processing

dedicated to understanding and integrating new information. According to Mayer (2014), germane load is the most desired cognitive outcome since it reflects the mental capacity that enables efficient learning. By employing cultural sounds and language, the animation facilitates what Butcher (2014) describes in the multimedia principle: people learn better when multiple complementary channels (in this case, visual images and culturally resonant audio) work together to reinforce the same message.

The analysis of the animation based on expert recommendations and cognitive multimedia learning principles demonstrates a sophisticated approach to health communication. By strategically employing familiar environments and culturally significant names, incorporating humour as a vehicle for serious health messaging, and utilising authentic local music and language, the animation maximises cognitive engagement while minimising barriers to comprehension. These elements work synergistically to create what Mayer (2014) would consider an optimal learning environment that respects the cognitive limitations of the audience while leveraging their cultural knowledge and sensory processing capabilities. The animation's effectiveness lies in its careful application of multimedia learning principles within a culturally authentic framework, transforming what could have been a didactic health message into an engaging, memorable, and persuasive communication tool. Through this thoughtful approach, the animation not only delivers critical information about Malaria prevention but does so in a way that respects and resonates with the cultural identity of its intended audience, potentially leading to greater behavior change impact than conventional health education methods.

### **5.3 Discussions of findings of Research Question Three**

This section of the study discusses the findings of the post-production stage.

Data was collected through interviews and observation.

#### **5.3.1 RQ. 3. How do community dwellers interpret the communication and persuasive elements used in the developed Malaria Education Animation for the Effutu Communities?**

This section presents an in-depth analysis of how community dwellers interpreted the communication and persuasive elements in the Malaria education animation. Through a thorough examination of participant's responses and feedback, several key themes emerged that illuminate how the community dwellers interpreted the persuasive and communication elements in the animation. The analysis focused on how the different aspects of the animation from character design and visual metaphors, to narrative structure and cultural elements that resonated with or challenged viewers' existing knowledge and beliefs about Malaria.

The following three (3) themes emerged from the participants' responses: Visual comprehension and cultural resonance, message clarity and information processing, and emotional engagement and persuasive impact. These three themes, while distinct in their focus, are interconnected and collectively provide a comprehensive framework for understanding how the animation's communication and persuasive elements functioned within the Effutu community's context.



*Figure 84. Health Officers engaging with community dwellers at a community centre in Winneba.*


*Source: Researcher's fieldwork, 2024*

### **5.3.1.1 Visual Comprehension and Cultural Resonance**

A central theme that emerged was visual comprehension and cultural resonance, which explores how viewers interpreted the animation through their cultural lens. Grounded in the Cognitive Theory of Multimedia Learning (CTML), particularly its active-processing assumption, the animation engaged viewers in selecting relevant cultural material, organising it into coherent mental representations, and integrating it with their existing knowledge of local practices (Mayer, 2001). This engagement aligns with Mayer's Multimedia Principle (Butcher, 2014) and Split-Attention Principle (Ayres & Sweller, 2014), which posit that learning is optimised when words and images are presented simultaneously in an integrated manner. The animation's effectiveness in reinforcing cultural resonance is evident in its use of familiar imagery, local settings, and cultural references, ensuring message reception and comprehension.

The animation activated viewers' sensory memory through culturally familiar visuals and sounds while engaging working memory by situating messages within relevant local contexts. This integration ultimately supported the transfer of information to long-term memory through cultural association (Atkinson & Shiffrin, 1968). Recognisable local architecture, familiar social settings, and cultural symbols reinforced message retention and engagement. Additionally, integrating local aesthetic preferences including colour choices and artistic styles enhanced viewer connection and involvement.

Participants' responses illustrated the deep cultural connection fostered by the animation.



*The moment I heard the name 'Nenyi', I connected with the character because that's how we call and respect our elderly men here in Effutu. The way he was portrayed watching television in his hall during breakfast, that is exactly how most of our elderly men spend their mornings here. But what really struck me was the hospital scene. It is our very own Trauma and Specialist Hospital! Even the OPD looks exactly the same – the chairs, the paint colour, structure, everything. When I saw this, I thought “This is not just any story, this is happening right here in Winneba.” The background music, similar to our Effutu rhythm made me feel like I was watching our own local story, not something brought from somewhere. (E. Mensah, personal communication, January 10, 2025)*

E. Mensah's testimony reveals multiple layers of cultural connection within the animation. His response demonstrates the effectiveness of the signalling principle (Mayer & Fiorella, 2014), where familiar cultural cues like the name 'Nenyi' and local architectural features served as cognitive guides, helping direct attention to key learning elements. His immediate recognition of the honorific “Nenyi” demonstrates how the animation established cultural legitimacy from its opening scenes. The portrayal of familiar morning routines created a mirror of daily life that he could instantly relate to. Most significantly, his reaction to the precise replication of the Trauma and Specialist

Hospital, down to the specific details of the OPD, transformed the animation from a generic health message into a locally-embedded narrative. The incorporation of Effutu rhythms in the background further reinforced this local connection, making the content feel like an authentic community story rather than an external intervention.

*That market scene with the woman selling tomatoes next to the gutter – I see this every day at our market. Many of us sellers don't realise how these gutters with rotten food stuff serve as a breeding ground for mosquitoes. The animation showed exactly how we conduct our business, but now I understand why it is dangerous to pour our rotten vegetables in these gutters and also sell near them. What made me really pay attention was the use of our Fante language in the narration. When they described Nenyi's death in that humorous tone at the end. That's exactly how we Effutu people would tell such a cautionary tale! We often use humour to teach serious lessons. It made me laugh but also scared me about my own habits. (I. Eno, personal communication, January 17, 2025)*

I. Eno's immediate identification with the market scene, particularly the familiar sight of produce being sold near the gutters, created a moment of self-reflection about common practices in the community. The animation's use of Fante language, combined with visual elements, enhanced her engagement with the content. Most notably, her response to the humorous tone used in narrating Nenyi's fate demonstrates how the animation successfully incorporated traditional Effutu storytelling methods.

Her testimony exemplifies the personalisation principle of CTML, where the use of conversational Fante Language and culturally appropriate humour created a social partnership that enhanced learning. The temporal contiguity between familiar market scenes and new health information about gutter practices optimised the split-attention effect (Ayres & Sweller, 2014), making the message more cognitively accessible.

*The scene showing Nenyi cooking shirtless in his compound with that full dustbin – that is common sight in many homes here. I must confess, I do the same sometimes. But what got my attention was the voice-over's tone describing how Nenyi's arrogance led to his death. The way it said it in our Fante language, with that typical Effutu humour we use when mocking stubborn behaviour – it hit differently. It reminded me of how our elders tell stories to teach lessons. Even the background music sounded like our local Effutu songs we play during festivals. This wasn't just an education video, it felt like our own community was telling us our own story. (Y. Sika, personal communication, January 14, 2025)*

His recognition of common practices, such as cooking shirtless with an open dustbin nearby, led to an acknowledgement of his own risky behaviours. His response to the familiar musical elements further emphasises how the animation successfully created a multi-sensory cultural experience. Most significantly, his statement that it felt like the community telling its own story indicates that the animation achieved its goal of being perceived as an authentic local narrative rather than an external health intervention. Y. Sika's reaction demonstrates the embodiment principle (Mayer, 2014) in action, where the animation's characters exhibited culturally authentic gestures and movements that enhanced learning. His recognition of common practices led to self-reflection, indicating successful activation of the active processing assumption, where learners engage in selecting, organising, and integrating information with prior knowledge (Mayer, 2005).

Under this theme, the precise reproduction of landmarks, particularly the Trauma and Specialist Hospital, created immediate credibility and relevance. This attention to detail helped viewers connect the health message to their immediate environment, making the threat of Malaria feel more immediate and real. The integration of humour and storytelling traditions, particularly in the narration of Nenyi's fate, demonstrated how cultural communication patterns can enhance message

reception and the familiar style of using humour to deliver serious messages resonated deeply with viewers.

The accurate depiction of common local practices, both good and bad, prompted viewers to reflect on their own behaviours. This recognition created a non-threatening space for viewers to consider their own risky behaviours. Likewise, the combination of visual elements with culturally appropriate music and language created a comprehensive cultural experience that enhanced message retention. The use of local rhythms and Fante Language also strengthened the animation's cultural authenticity and the detailed representation of daily life scenarios, from market scenes to household activities, helped viewers see the relevance of Malaria prevention in their everyday contexts.

From the responses given by the viewers, the animation was effective in management of cognitive load (Sweller, 1998), particularly by reducing extraneous load through familiar cultural elements, optimising intrinsic load by presenting health information within recognisable contexts, and maximising germane load through cultural engagement that promotes schema construction.

Also, several key CTML principles were working in concert: the combination of visual elements, local language, and cultural music created complementary processing channels that enhanced understanding, cultural familiar elements served as cognitive scaffolds guiding viewers through new health information, and the dynamic presentation of familiar scenarios made abstract health concepts concrete and understandable.

The precise reproduction of landmarks created immediate credibility and relevance, while managing cognitive load by anchoring new information to existing

mental models. The integration of humour and storytelling traditions exemplified the voice principle (Mayer, 2014), where familiar vocal delivery enhanced social presence and learning.

### **5.3.1.2 Message Clarity and Information Processing**

The theme of message clarity and information processing examines how effectively educational content was communicated through visual and auditory elements. It highlights the practical application of the Cognitive Theory of Multimedia Learning (CTML) and its limited-capacity assumption, demonstrating how the animation managed cognitive load by structuring complex medical information through carefully designed visual and auditory channels (Sweller, 1998). By engaging the cognitive architecture of sensory memory, working memory, and long-term memory through strategic information presentation, the animation facilitated comprehension, processing, and retention of health-related content. Mayer's (2005) active-processing assumption is evident in how viewers selected relevant medical information, organised it into coherent mental representations, and integrated it with their existing health knowledge. This approach aligns with Kojima et al.'s (2010) notion of managing each stage of the psychological transition in information processing.

The animation followed a structured approach to engaging viewers, ensuring clear cause-and-effect relationships in Malaria transmission and progression. The step-by-step depiction of risk factors, such as exposure to mosquitoes, self-medication, and delayed treatment, created a logical narrative that strengthened comprehension. The AIDA model (St. Elmo Lewis, as cited in Strong, 1925) is reflected in how the animation captured attention through relatable scenarios, sustained interest with a compelling narrative, generated desire by illustrating the consequences of untreated

Malaria, and ultimately motivated viewers toward action, such as using mosquito nets and seeking prompt medical care.

*The way the animation showed how mosquitoes kept entering Nenyi's room through the open door and him cooking shirtless even though there was a full open dustbin breeding mosquitoes was very clear. I had never thought about how each of these small actions build up to create danger. When they showed the dustbin, I immediately connected it to the overflowing bin in my own compound. The progression from getting bitten to falling sick after a few days helped me understand how Malaria develops. What made it even clearer was how they showed his condition worsening because he tried self-medication instead of going to our Trauma and Specialist Hospital immediately. (T. Kyere, personal communication, January 10, 2025)*

T. Kyere's testimony demonstrates the animation's success in establishing clear cause-and-effect relationships in Malaria transmission and progression. Her understanding of how multiple risk factors contribute to Malaria exposure indicates effective visual communication of complex health concepts. It also exemplifies the successful application of Mayer's (2005) spatial contiguity principle, where related visual elements were presented in close proximity to enhance understanding. This approach aligns with what Vakratsas and Ambler (1999) identify as effective use of attention-grabbing visuals to maintain viewer engagement.

The animation's portrayal of familiar scenarios enabled her to connect the health information to her own environment and behaviours. Most significantly, her comprehension of the dangers of self-medication and delayed treatment shows how the sequential presentation of health consequences effectively conveyed crucial medical information (Mayer, 2009).

*Everything was broken down step by step. From the mosquitoes at the market biting him near the gutter, to the ones in his compound because of the full dustbin, and finally in his room because he didn't use a net. The Fante explanation made it even better because it described exactly what we were seeing. When they showed how quickly his condition got*

*worse after trying to treat himself, it reminded me of my cousin who did the same thing last year. The message was clear; prevention is better, but if you get Malaria, go to the hospital quickly. (A. Bambi, personal communication, January 11, 2025)*

A. Bambi's observations reveal how the animation's structured presentation of information enhanced understanding of Malaria prevention and treatment. His ability to track the multiple exposure points demonstrates successful communication of risk factors. The synchronisation of visual elements with local language narration strengthened message comprehension (Mayer & Moreno, 2003). Particularly noteworthy is how the animation's depiction of illness progression resonated with his personal experiences, making the health message more impactful and memorable.

A. Bambi's observations highlight the successful implementation of the signalling principle where key information about Malaria transmission was emphasised through visual cues and narrative structure (Mayer, 2014). The synchronisation of visual elements with Fante narration exemplifies the modality principle, where verbal information presented in audio format complements visual processing without overwhelming working memory (Mayer & Moreno, 1998).

*Watching how Nenyi ignored all the warning signs was both frustrating and educational. The animation clearly showed each mistake; not covering the dustbin, cooking outside without protection, sleeping without a net. They also showed the hospital properly; from the entrance to the OPD, making it feel real and familiar. The part that struck me most was how they showed his quick death after reaching the hospital too late. The voice speaking Fante made fun of his stubbornness, but the message was serious – these little careless actions can lead to death. (O. Nindow, personal communication, January 18, 2025)*

O. Nindow's reaction highlights the animation's effectiveness in communicating both preventive measures and consequences. Her detailed recall of each risk behaviour indicates successful information packaging and delivery (Mayer, 2014). The use of a

familiar hospital setting enhanced the credibility of the medical information presented. Most importantly, her understanding of how the animation balanced humorous delivery with serious health messages shows how cultural communication styles can enhance information processing (Schnotz & Bannert, 2003).

It also demonstrates the effectiveness of the worked examples principle, where concrete demonstrations of both incorrect and correct health behaviours provided clear learning models (Mayer, 2019). Her detailed recall indicates successful activation of the active processing assumption, showing how the animation facilitated the selection, organisation, and integration of critical health information (Mayer, 2005).

*I was initially confused about why they showed a gutter that wasn't very dirty, with tomatoes that didn't look too rotten. In our market, we usually think mosquitoes only breed in really filthy gutters. But as I watched Nenyi get bitten while buying tomatoes, I began to understand - the animation was teaching us that mosquitoes don't wait for gutters to become completely filthy. This was new information for me, making me realise we've been wrong to ignore gutters just because they don't look too dirty. (Y. Amissah, personal communication, January 15, 2025)*

Y. Amissah's initial confusion followed by comprehension demonstrates how the animation effectively challenged and reconstructed existing knowledge. The subtle presentation of a relatively clean gutter served as an educational tool that expanded understanding of mosquito breeding conditions (Chi, 2009). Most importantly, this deliberate visual choice helped process new information about health risks by contradicting common misconceptions about what constitutes dangerous environmental conditions (Mayer, 2017).

Y. Amissah's experience illustrates the guided discovery principle in action, where the animation carefully scaffolded the reconstruction of existing knowledge about mosquito breeding conditions (Clark et al., 2012). The participant's cognitive

process of reconciling new information with existing beliefs demonstrates effective management of cognitive load during conceptual change (Sweller, 2010).

The animation's structured approach effectively managed cognitive processing by reducing extraneous load, segmenting information, and connecting it to familiar knowledge (Mayer, 2005). The depiction of a step-by-step sequence from exposure to illness progression ensured a clear understanding of cause and effect, reinforcing critical health messages. The integration of Fante language further enhanced cultural relevance, making the content more engaging and easier to retain (Reinwein, 2012). The use of culturally appropriate humour and storytelling techniques made complex health information more digestible while maintaining the seriousness of the message.

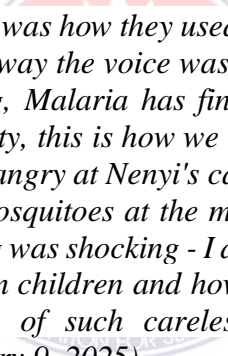
By placing health information within familiar local settings, such as the accurate representation of the hospital, the animation made medical concepts more accessible and relatable to viewers. The clear depiction of how specific actions (or inactions) led to health consequences helped reinforce the importance of prevention and proper treatment. The combination of visual demonstrations with local language narration further strengthened message clarity and retention (Mayer & Moreno, 2010). Ultimately, the animation successfully guided viewers through the cognitive process of engaging with and internalising Malaria prevention and treatment messages, ensuring both comprehension and behavioural impact.

### **5.3.1.3 Emotional Engagement and Persuasive Impact**

The theme of emotional engagement and persuasive impact examines how emotional connections are established and leveraged to influence viewer attitudes and behaviours. It explores how narrative elements, character development, and dramatic situations create emotional resonance, enhancing message reception. The analysis

investigates the role of various emotional appeals such as humour, fear, and empathy in crafting compelling health messages that motivate behaviour change. Additionally, it considers how cultural emotional expressions and local storytelling traditions shape the persuasive power of health communications.

This aligns with Mayer and Estrella's (2014) findings that emotional engagement enhances cognitive processing by increasing motivation and attention, thereby improving learning outcomes in multimedia environments. Following the AIDA model, this theme demonstrates how emotional elements optimise cognitive processing in multimedia learning, particularly through the enhancement of germane cognitive load.



*What touched me most was how they used our Effutu style of mockery to tell Nenyi's story. The way the voice was laughing while saying 'Oh, so after all your boasting, Malaria has finished you!' - it was funny but scary. In our community, this is how we teach stubborn people lessons. I found myself getting angry at Nenyi's carelessness, especially because the dirty gutter and mosquitoes at the market reminded me of where I sell my fish. The ending was shocking - I didn't expect him to die. It made me think about my own children and how I wouldn't want them to lose their mother because of such carelessness. (S. Swanzy, personal communication, January 9, 2025)*

S. Swanzy's testimony reveals the complex emotional impact of culturally rooted storytelling. Her response to the traditional Effutu mockery highlights how emotional engagement functions as an attention-capturing mechanism, as identified in Mayer and Estrella's (2014) research on emotion and multimedia learning. The animation's ability to provoke amusement, anger, and fear created a deeply engaging experience. This aligns with Mayer's (2005) personalisation principle, which emphasises how conversational style and cultural humour enhance social presence and engagement. Most importantly, Participant R1's connection of the story to her role as a

mother demonstrates how the animation successfully triggered personal emotional investment in the health message.

*I felt like I was watching my own story. Every morning, I also watch TV in my hall like Nenyi, and I often cook outside shirtless. The way they showed his pride and stubbornness, that is, refusing to sleep under a net or go to the hospital early, I saw myself in his character. When he died on the first day at the hospital, I felt a chill. The local Fante tunes in the background made everything feel so real, like it wasn't a story but a warning from our own community. And now, when I think about the animation, I remember that laughter in the voice-over mocking his death, and it makes me want to change my habits. (E. Tetteh, personal communication, January 9, 2025)*

E. Tetteh's emotional connection to the character underscores the animation's success in creating relatable personas that foster deeper engagement with the message. According to Mayer and Moreno (2003), characters that reflect real-life behaviour increase learners' ability to integrate new information with prior knowledge, enhancing comprehension and retention. His self-identification with Nenyi's behaviour indicates effective character development that prompted personal reflection. The impact of the death scene, amplified by cultural musical elements, created a memorable emotional experience. The combination of familiar cultural cues with serious health consequences resulted in a lasting impression that motivated behavioural change. E. Tetteh's experience exemplifies Renkl's (2002) worked examples principle, where identification with a character's behaviour provides emotional scaffolding for learning by selecting relevant personal behaviour for comparison (Mayer & Estrella, 2014), organising them into meaningful patterns (Sweller, 1998), and integrating them with new health knowledge (Moreno & Mayer, 2007).

*The animation made me feel several emotions at once. First, there was recognition because the hospital scenes were exactly like our Trauma and Specialist Hospital. Even seeing that familiar entrance gave me a strong feeling. Then there was frustration watching Nenyi ignore all the obvious signs and risks. The way they used our local humour to tell such a serious story was clever - it made me laugh but also feel afraid. By the*

*end, when he died after being so careless, I felt both sad and angry. As a teacher, it made me want to ensure my students understand these dangers. (B. Effe, personal communication, January 17, 2025)*

B. Effe's experience highlights how the animation successfully layered multiple emotional appeals. Her response to familiar locations aligns with Mayer's (2005) spatial contiguity principle, where environmental authenticity deepens engagement. The progression of emotions throughout the narrative, from recognition to frustration to fear demonstrates effective emotional pacing. Most significantly, her professional response as a teacher indicates how emotional engagement extends beyond personal impact to influence broader community awareness, a key feature of persuasive health messaging (Fogg, 2009).

The animation's use of traditional Effutu mockery and humour illustrates how culturally relevant humour and social norms serve as attention-grabbing mechanisms (George et al., 2013). Familiar emotional appeals enhanced message impact by provoking amusement, anger, and fear, aligning with Mayer's (2005) signalling principle, where emotionally charged cues guide viewer focus to key health risks. E. Tetteh's emotional connection to the character also demonstrates the animation's success in maintaining viewer interest (O'Keefe, 2016) and exemplifies Renkl's (2014) worked examples principle, where depictions of both correct and incorrect health behaviours provided concrete learning models.

B. Effe's layered emotional response follows the AIDA model, which emphasises the importance of building desire to engage with a message. Her response to familiar locations underscores the coherence principle (Mayer & Moreno, 2003), where clear, focused storytelling minimises distractions while maximising emotional impact.

By combining different emotional elements such as humour, fear, recognition, and shock, the animation created a complex emotional experience that strengthened message retention and impact. The use of familiar locations, particularly the local hospital, created an emotional anchor that made the health message feel more immediate and relevant (Dunlop et al., 2010). The unexpected death of the main character, combined with cultural storytelling elements, created a powerful emotional culmination that reinforced the health message.

The animation's realistic portrayal of common local behaviours and settings facilitated strong emotional connections, prompting self-reflection and a desire for behaviour change. The traditional Effutu mockery exemplifies how cultural emotional expressions serve as cognitive aids in information processing. The combination of humour and fear created optimal arousal levels for learning while managing cognitive load. The emotional design of the animation supported learning through strategic use of cultural emotional expressions to reduce cognitive load, careful balancing of emotional appeals to maintain engagement without overwhelming viewers and integration of familiar emotional patterns to support schema development.

Ultimately, the animation's use of cultural humour, emotional pacing, and relatable scenarios fostered deep emotional engagement, effectively reinforcing health messages and inspiring behavioural change.

By applying the AIDA Model to the responses from the participants/viewers, it can be inferred that the animation effectively captured viewers' attention by leveraging culturally familiar visuals, linguistic styles, and humour, reinforcing Vakratsas and Ambler's (1999) assertion that "attention-grabbing visuals" play a crucial role in engagement. The replication of well-known settings, such as the Trauma and Specialist

Hospital, and the use of culturally significant names like "Nenyi" served as immediate cognitive triggers, creating an instant connection between the audience and the narrative. Lowe and Schnotz (2014) emphasise that dynamic highlighting techniques enhance learners' attention, a principle evident in B. Effe's immediate recognition of the hospital setting, which deepened her emotional engagement. Similarly, S. Swanzy noted how the traditional Effutu mockery used in the narration – *"Oh, so after all your boasting, Malaria has finished you!"* – was both amusing and unsettling, demonstrating the animation's use of culturally embedded humour as an attention-grabbing mechanism.

Interest was sustained by integrating familiar social and environmental elements into the storyline, aligning with Belch and Belch's (2018) observation that emotional appeals generate interest by resonating with an audience's values and beliefs. E. Tetteh described how Nenyi's pride and reluctance to use a mosquito net or seek medical attention reflected his own behaviours, making the story feel deeply personal. This aligns with Mayer and Moreno's (2003) research, which suggests that relatable characters enhance information retention by helping audiences integrate new knowledge with prior experiences. The use of local music and environmental authenticity further reinforced engagement, as B. Effe noted how the hospital's resemblance to a real-life facility intensified the realism of the narrative. The use of personal, conversational storytelling, as supported by Mayer's (2005) personalisation principle, ensured that viewers remained emotionally and cognitively involved in the unfolding events.

Desire for change was cultivated through personalised and emotionally resonant storytelling techniques that encouraged self-reflection on habitual behaviours. The combination of humour, fear, and empathy created a powerful emotional arc that

reinforced key health messages. S. Swanzy, for example, described how her initial amusement at the mockery quickly turned into frustration and fear as she realised the connection between Nenyi's carelessness and the unhygienic conditions at her own workplace. This response supports Mayer and Estrella's (2014) findings that emotional engagement enhances cognitive processing by increasing motivation and attention. Similarly, E. Tetteh admitted that Nenyi's unexpected death at the hospital sent a chill down his spine, particularly when combined with the eerie Fante music in the background, making the moment feel like a direct warning to his own life choices. The emotional pacing of the animation, from light-hearted humour to shock and fear, sustains interest and improves desire as proposed by Lewis' AIDA Model. B. Effe's frustration at Nenyi's stubbornness and ultimate fate further illustrates how emotional responses drive internalisation of health messages, supporting the signalling principle (Mayer, 2005), where emotionally charged cues, direct audience focus toward critical health risks.

Ultimately, the animation facilitated behavioural change by encouraging viewers to reconsider their everyday practices through culturally embedded messaging and emotional impact. The accurate depiction of common local habits allowed for self-assessment in a non-threatening manner, ensuring that viewers reflected on their behaviours rather than feeling alienated. E. Tetteh's lingering memory of the mocking laughter in the voice-over, which he associated with his own past decisions, exemplifies how culturally relevant humour reinforced message retention. S. Swanzy's concern about her children potentially losing their mother due to poor hygiene habits highlights how emotional engagement translated into a genuine motivation to adopt healthier practices. B. Effe's commitment to educating her students on Malaria prevention

demonstrates how the animation's impact extended beyond personal reflection to broader community influence.

To conclude, the analysis of the animation through the three key themes, visual comprehension and cultural resonance, message clarity and information processing, and emotional engagement and persuasive impact demonstrates the intricate interplay between storytelling, cultural relevance, and audience engagement in effective health communication. Each theme contributes uniquely to the animation's ability to captivate, inform, and influence behaviour, yet they are interconnected in shaping the overall impact of the message.

The first theme, *Visual Comprehension and Cultural Resonance*, highlights how the integration of local dialects, proverbs, and culturally embedded humour enhances comprehension and relatability. The use of recognisable speech patterns and storytelling traditions helps reduce cognitive load, allowing viewers to process the health message more effectively. By situating the narrative within familiar social contexts, the animation fosters an immediate sense of connection, ensuring that the audience remains engaged while naturally absorbing key information.

The second theme, *Message Clarity and Information Processing*, emphasises the importance of well-structured storytelling in facilitating information recall and long-term retention. The animation employs a clear narrative arc, featuring conflict, progression, and resolution, to guide viewers through the health risks associated with Malaria. By depicting the protagonist's gradual decline due to negligence, the story reinforces the dangers of delayed treatment and preventative care. Additionally, the alignment with cognitive theories such as Mayer's multimedia learning principles

demonstrates how strategic narrative design optimises memory encoding and message internalisation.

The third theme, *Emotional Engagement and Persuasive Impact*, explores how the animation leverages emotional appeals to drive behavioural change. Humour, fear, and empathy are seamlessly woven into the story, creating a dynamic emotional experience that enhances attentiveness and personal reflection. The strategic use of traditional Effutu mockery, coupled with a shocking yet realistic conclusion, evokes a strong emotional response, prompting viewers to reassess their health practices. The animation's ability to foster identification with characters and real-life situations ensures that the message extends beyond passive viewing to active behavioural consideration.

Collectively, these themes illustrate how a culturally resonant, narratively compelling, and emotionally engaging approach to health communication can significantly enhance audience understanding and motivation. The synergy between cultural familiarity, structured storytelling, and emotional resonance ensures that the health message is not only understood but also internalised and acted upon. This underscores the critical role of culturally tailored multimedia interventions in public health education, particularly in contexts where traditional oral storytelling remains a dominant mode of communication. By effectively bridging cognitive, narrative, and emotional dimensions, the animation serves as a powerful tool for shaping health perceptions and promoting meaningful behaviour change within the community.

An observation checklist was also used to collect important non-verbal data when the animation was shown to the community folks and health officers at the various health and community centres. Every observation helped the researcher to identify the

trends, gestures and insights that could not be apparent in the interview data. The researcher also acted as a professional stranger to avoid any form of bias and to maintain objectivity during the observation. Objectivity during the observation process ensures accuracy and reliability.

During the sessions, it was observed that the attention of majority of the participants was focused on the animation which suggested that they were very much interested in the information being provided. The manner in which the participants paid attention to the animation clearly aligns with Vakratsas and Ambler (1999) assertions that, one of the unique ways to capture people's attention is through the use of attention-grabbing headlines or visual cues. The attention of the participants was grabbed when they heard that Malaria claims a lot of lives every year than most illnesses. For example, the animation captured that over 425000 people died of Malaria in 2020. 95 percent of that number of deaths occurred in Africa. The statistics went on to say that over 12000 Ghanaians died of Malaria in 2021 which was according to World Health Organisation (WHO). This mention drew comments and facial expressions such as "eeeeiiisshhh, really, the shock on some of the faces of the participants communicated that they attention had been captured based on the serious statistics and headlines.

The attention that was derived from the participants by the animation led to a significant number of viewers being curious in instances such as when the protagonist of the animation opted for self-medication instead of visiting the health centre when he experienced severe symptoms of Malaria.

Majority of both health officers and community folks appeared excited about the animation because of the smiles showing on their faces while watching the

animation, and also based on the slight interaction I observed took place especially among the health officers.

It was also very clear from the facial expressions, body language, the waoow moments (shock and surprise) and the sudden unison exclamation of “Trauma Hospital” the moment they saw the exact rendition of the hospital in the animation that the participants were interested in the animation and hence paid particular attention to its contents.

Moreover, the humorous comments made in the voice-over about the death of the protagonist which got majority of the participants laughing also suggested that the participants appreciated the humorous components of the animation.

The animation drew several conversations and engagement about Malaria after participants watched it. Participants’ excitement and engagement in further discussions on Malaria suggested that the animation was informative and interesting.

The researcher observed a participant’s attention swaying to his mobile phone for some considerable minutes. When the participants were interviewed about the reason for concentrating on the phone at a point in time, he/she attributed it to the lengthy nature of the video and the need for him/her to attend to an urgent responsibility on the phone.

In conclusion, the observation appeared to show the level of acceptance of the animation by the participants. This was evident through participants use of gestures, facial expressions and overall body language.

#### 5.4 Discussions of findings of Research Question Four

This section of the study discusses the findings of the post-production stage.

Data was collected through interviews and observation.

##### 5.4.1 RQ. 4. What are the health officers' perspectives about the developed Malaria Education Animation for the Effutu Communities?

This research question explores the perspectives of health officers regarding the Malaria education animation developed for the Effutu community. Their views provide insight into how the animation was received, interpreted, and assessed in terms of its educational purpose and communicative effectiveness. The AIDA Model (Lewis, 1898) helps explain how the animation guided audiences through stages of attention, interest, desire, and action, while the Cognitive Theory of Multimedia Learning (CTML) (Mayer, 2014) offers a framework for understanding how the animation's use of visuals and narration contributed to message clarity, retention, and audience engagement.



Figure 85. Researcher engaging with health officers at health facilities in Winneba

Source: Researcher's fieldwork, 2024

#### 5.4.1.1 Capturing Attention Through Engaging Visuals and Audio

For awareness campaigns to be effective, the animation must first capture and sustain audience attention. According to the AIDA Model's Attention phase, engaging visuals and storytelling are key to drawing viewers into the content. Health officers noted that the animation successfully captured attention due to its colourful and dynamic visuals, relatable characters, and culturally relevant setting.

*The bright colours and expressive characters made people stop and watch. It was different from the usual posters or leaflets we give them. Also, the Malaria statistics in the animation clearly showed how serious Malaria is and the harm it is causing each day, month and year. To me, it is a strong message which must be known by the public. Even some of the viewers said that they did not know how dangerous Malaria was based on the statistics. Some of my colleague health workers were also amazed by the statistics (P. Amoako, personal communication, January 9, 2025)*

The animation employs CTML's multimedia principle, which states that people learn better from a combination of images and words rather than words alone (Mayer, 2014). By pairing visuals with narration in the local dialect, the animation ensured accessibility and engagement for audiences of varying literacy levels. In the view above, it is obvious that the visuals and its accompanying audio (voice-over) play its various roles in getting the attention of the health officers.

Furthermore, background tune and sound effects contributed to sustaining attention. Several health officers observed that suspenseful sound effects during Malaria transmission scenes heightened engagement, reinforcing the message.

*Personally, the background sound got my attention. I noticed it got some of my co-workers nodding to the tune. Another part that got me interested in the video was the moment the mosquito bit Nenyi, the dramatic sound got my attention. (W. Assey, personal communication, January 14, 2025)*

The animation strategically uses visual contrast to direct the audience's focus to key moments. Scenes of a healthy, active man (Nenyi) before a mosquito bite, followed by a weak and feverish Nenyi after infection, create a stark difference that visually reinforces the impact of Malaria. According to CTML's signalling principle, such techniques help guide learners' attention to critical elements, improving comprehension and retention (Mayer & Moreno, 2003).

Additionally, the animation effectively leverages movement and animation pacing to sustain attention. Unlike static images in posters, the video uses fluid motion, zoom effects, and expressive gestures to keep viewers engaged. This aligns with CTML's dynamic visualization principle, which states that people process information better when concepts are demonstrated dynamically rather than in still images (Mayer, 2014).

Health officers also highlighted the importance of culturally familiar settings in maintaining audience interest. The animation features the Trauma Specialist Hospital, stagnant waters, a market place, family compounds, and traditional clothing, ensuring that viewers see their own realities reflected in the story.

*People related to the characters because they looked like them. That made them stay and watch because they felt it was made for them. I was personally excited when I saw the Trauma Hospital. It looked so real. One of my colleagues commented "eeeeii, Trauma is in the animation, waaaa". (R. Joy, personal communication, January 9, 2025)*

Moreover, facial expressions and exaggerated reactions in the animation served as powerful engagement tools. Scenes depicting shock or worry when a mosquito bites a character helped emphasise the seriousness of Malaria without relying solely on narration. This technique aligns with CTML's embodiment principle, which suggests

that learners pay more attention when characters display lifelike expressions and emotions (Mayer, 2014).

Despite these strengths, some health officers noted that the speed of narration and scene transitions might be too fast for older viewers or those unfamiliar with Malaria education.

*In my opinion, I think the video moves quickly for me. Some elderly people may need more time to process each scene. (V. Hannah, personal communication, January 14, 2025)*

This observation aligns with CTML's segmenting principle, which suggests that breaking down information into smaller, digestible parts improves comprehension (Sweller, 2010). Future adaptations of the animation could incorporate short pauses between key scenes or summary segments to reinforce learning before progressing to the next concept.

Some health officers also pointed out the need for re-watching the animation multiple times to enhance understanding and retention, particularly for older audiences and individuals with limited prior exposure to Malaria education.

*Younger people grasp it quickly, but for some older folks, watching twice or three times helps them get everything. (B. Raymond, personal communication, January 9, 2025)*

This aligns with CTML's spaced repetition principle, which states that learning improves when key messages are revisited multiple times over spaced intervals (Mayer, 2014). Integrating opportunities for repeat viewings or reinforcement sessions could further strengthen message retention and behavioural application.

Additionally, some health officers suggested that community screenings of the animation should be followed by interactive discussions to ensure that all viewers fully grasp the key messages.

*It works well, but we need to talk about it afterward. Some people still have questions, and discussion helps clarity of any doubt. (S. Sky, personal communication, January 9, 2025)*

This aligns with CTML's active learning principle, which suggests that audiences retain more knowledge when they have the opportunity to interact with the content rather than passively consuming it (Mayer, 2014).

Overall, the animation effectively captured attention and sustained engagement by combining vivid visuals, sound effects, movement, cultural relevance, and emotional expressions. However, adjustments in pacing, repeat viewings, and interactive reinforcement strategies could further enhance its effectiveness for diverse audience groups.

#### **5.4.1.2 Enhancing Interest and Comprehension Through Storytelling**

Once attention is captured, it is crucial to maintain interest to ensure message retention. The AIDA Model's Interest phase highlights that information must be relevant and relatable for audiences to stay engaged. Health officers emphasized that the animation's narrative format was effective in sustaining interest compared to traditional lecture-based health education.

*People followed the story because they saw themselves in it. It wasn't just facts; it was a real-life scenario they could relate to. The fact that the animation depicted the real-life environment got me very interested in it. I could tell that my colleague health workers were interested in the animation because I heard one of them saying that the Trauma Hospital, Market scene and the clean water in the gutter looked so real. Mosquitos actually breed very well in clean waters. This is good. (R. Joy, personal communication, January 9, 2025)*

According to CTML's coherence principle, people learn better when information is presented in a structured and meaningful way rather than as isolated facts (Mayer, 2014). The animation followed a cause-and-effect narrative structure, showing how mosquitoes breed, bite, and cause Malaria, making the educational content more engaging and memorable.

Additionally, health officers noted that character-driven storytelling improved comprehension. The depiction of a man not practicing clean hygiene and resorting to self-medication after getting infected which ultimately lead to death created emotional investment, reinforcing the importance of early Malaria treatment.

*The story of the man made a strong impact. It reminded people that Malaria can affect anyone, even the strong and active ones. Mosquitoes breed well in clean stagnant waters was my key takeaway. (V. Hannah, personal communication, January 9, 2025)*

The animation's pacing and use of suspenseful storytelling techniques such as delayed revelation of Malaria symptoms and consequences heightened engagement. According to CTML's personalization principle, when audiences see familiar situations reflected in a story, they become more emotionally invested in the outcome, which enhances learning retention (Mayer, 2014).

Moreover, the use of multiple perspectives including family members, community leaders, and health workers enriched the narrative, making it more comprehensive and persuasive. This aligns with CTML's segmentation principle, which states that learning is enhanced when information is broken down into digestible parts and delivered through multiple angles (Mayer, 2014).

Health officers also observed that the story's realism such as the character being indifferent to maintaining cleanliness in his surroundings, leaving himself exposed to

mosquitoes at bedtime, and debating the most effective prevention measures helped to reinforce real-world problem-solving skills. This is consistent with CTML's generative learning principle, which suggests that people retain information better when they must apply knowledge in realistic scenarios (Fiorella & Mayer, 2015).

*The animation depicted a man who felt he was too important to go to the hospital, choosing instead to self-medicate, which made people reflect on similar attitudes in their own communities. That part of the animation to me is very good. The people will be careful. (Q. Liam, personal communication, January 14, 2025)*

The animation's ability to evoke empathy and social responsibility further strengthened engagement. Scenes illustrating the man's disregard for prevention and its consequences fostered emotional connections, prompting viewers to consider how such behaviours contribute to the spread of Malaria. According to CTML's emotional engagement principle, integrating emotionally charged moments into educational content enhances motivation and retention (Mayer, 2014).

*The way he (Nenyi) ignored the risks, and thought nothing would happen to him made people (patients) take the message seriously. They recognised the need to take the dangers associated to being sick of Malaria. (R. Asiedu, personal communication, January 9, 2025)*

Additionally, the use of humour in selected scenes such as exaggerated mosquito reactions helped lighten the mood and sustain interest. Research suggests that humour can improve cognitive engagement by reducing resistance to learning new information (Mayer & Estrella, 2014). Health officers noted that this balance between seriousness and light-hearted moments made the animation more enjoyable to watch.

*I laughed and also say people laughing at certain moments, like when the mosquito was hit and the narrator made a humorous remark, but they still retained the message. (S. Sky, personal communication, January 9, 2025)*

Despite its effectiveness, some health officers pointed out that more diverse storylines could help sustain long-term engagement, especially for communities that had already seen the animation multiple times.

*The animation is very good. I like it. I think after watching a few times, some people may lose interest. Maybe different versions with new characters or scenarios would help. (T. Anane, personal communication, January 14, 2025)*

This aligns with CTML's variability principle, which states that slight modifications in instructional content help prevent cognitive fatigue and sustain engagement over repeated exposures (Mayer, 2014). Introducing alternative narratives that reinforce the same Malaria prevention concepts could maintain audience interest and prevent message saturation.

The animation's compelling narrative-maintained audience interest, enhanced comprehension, and encouraged an emotional connection to Malaria education, reinforcing its effectiveness as a tool for awareness. Future improvements could include diverse storylines, alternative character perspectives, and interactive elements to sustain engagement across repeated viewings and different audiences.

#### **5.4.1.3 Creating Desire for Behavioural Change**

The AIDA Model's Desire phase suggests that an effective educational tool must move beyond simply presenting information; it must generate an emotional and psychological need for behavioural change. Health officers highlighted that the animation successfully created a desire for Malaria prevention by showcasing realistic consequences of infection and the benefits of adopting protective measures.

*Seeing the characters, distil gutters, wear socks, and spray their surroundings with insecticides made people think, 'I should do this too.'*

*Meanwhile, the main character's refusal to sleep under the treated net reinforced the importance of using insecticide treated nets. (B. Raymond, personal communication, January 9, 2025)*

This aligns with CTML's modelling principle, which states that people are more likely to adopt behaviours when they see them demonstrated visually (Mayer, 2014). By portraying characters engaging in correct Malaria prevention behaviours, the animation transformed abstract health recommendations into clear, actionable steps.

The animation was praised for its ability to evoke strong emotional responses and stimulate personal reflection. Health officers observed that audiences connected with the message and demonstrated genuine attentiveness to the content. Viewers actively engaged with the scenes and began to relate the consequences of Malaria to their everyday lives.

*People watched and understood. It really made them reflect on their habits. (W. Assey, personal communication, January 14, 2025)*

This outcome aligns with Lewis' AIDA Model (1898), which highlights the effectiveness of generating interest and desire by pairing health risks with empowering actions. The animation communicated both aspects clearly, encouraging viewers to see themselves as capable of preventing Malaria through consistent and responsible behaviours.

The animation resonated strongly within the Effutu communities, where it presented biomedical perspectives on Malaria in a clear and culturally respectful manner. It prompted meaningful conversations around health, prevention, and everyday practices, contributing to greater community engagement with Malaria education.

*Some people believe Malaria comes from bad spirits or night air. The animation showed another way, and they started paying attention to*

*what was being said.* (V. Hannah, personal communication, January 10, 2025)

This reflects CTML's coherence principle, which affirms that learning is most effective when new ideas are connected to what people already know. By building that bridge, the animation encouraged viewers to consider new explanations while valuing their own lived experiences.

*There was a part where people started discussing what they believed and how it matched what the health worker said. That kind of thing makes the message stronger.* (P. Ampah, personal communication, January 14, 2025)

Health officers also observed that the animation inspired confident behavioural reflection. Audiences paid close attention to prevention practices shown in the scenes and began identifying how these practices could be applied in their own settings. This demonstrated not just interest, but readiness for action—a clear marker of behavioural desire in line with the AIDA model.

While the animation was generally effective in creating a desire for behavioural change, a challenge identified was habitual resistance to adopting preventive measures. Some community members were reportedly hesitant to consistently sleep under mosquito nets or eliminate standing water, even if they understood the benefits.

*Many people agree in theory, but changing daily habits is difficult. Just because they like the animation doesn't mean they will act on it.* (T. Anane, personal communication, January 14, 2025)

This aligns with CTML's cognitive load theory, which suggests that behavioural adoption requires both cognitive understanding and practical reinforcement (Sweller, 2010). Health officers recommended pairing the animation with real-life

demonstrations and community-led Malaria prevention activities to reinforce the transition from desire to action. The narration below suggests clear desire to take an action.

*If, after watching this animation, we immediately take people to set up their mosquito nets, the message sticks better. I'm saying this because, some of the parents who were around for weigh asked how the mosquito nets are treated, and the number of times they should wash them before they start using them. (R. Asiedu, personal communication, January 9, 2025)*

While the animation successfully raised awareness and inspired a desire for behavioural change, challenges remain in fostering a personal sense of urgency, addressing cultural misconceptions, and reinforcing long-term change through community-based interventions. Closing these gaps would further align the animation with CTML's focus on active learning and the AIDA Model's goal of sustained behaviour change.

#### **5.4.1.4 Encouraging Action Through Repetition and Reinforcement**

The final stage of the AIDA Model (Action phase) involves ensuring that viewers take tangible steps toward Malaria prevention. Health officers noted that the animation was effective in encouraging preventive behaviours, particularly in reinforcing the importance of early treatment and consistent net usage.

*The animation emphasised that Nenyi didn't sleep under treated mosquito net, and that resulted to his illness which led to his demise. It also mentioned the essence of sleeping under treated mosquito net as part of the preventive measures that were stated after the animation. When the animation ended, some people started asking if they were using their nets correctly. That's a sign of real impact. (Q. Liam, personal communication, January 9, 2025)*

This aligns with CTML's repetition principle, which states that repeating key messages enhances retention and the likelihood of behaviour change (Mayer, 2014). The animation reinforced prevention messages multiple times, ensuring that viewers remembered and applied them.

Health officers highlighted that character actions in the animation served as direct behavioural models for audiences. By visually demonstrating the process of covering stagnant water, hanging mosquito nets properly, and seeking medical attention at the first signs of fever, the animation facilitated practical learning and behavioural reinforcement.

*The video (animation) showed exactly how to prevent Malaria, step by step. People need to see it done before they believe it works. (R. Joy, personal communication, January 9, 2025)*

However, some health officers noted that while the animation effectively encouraged short-term interest in action, sustaining these behaviours over time remained a challenge. This aligns with CTML's theory, which suggests that without continued reinforcement, newly learned behaviours tend to fade over time (Mayer, 2014). To counter this, health officers suggested implementing community-based reinforcement strategies, such as post-viewing discussions, follow-up reminders, and periodic refresher screenings.

*Watching once is good, but if people see it again after some time, it will stay in their minds longer. For me, this animation will make our Malaria Education exercise easier if we add it to our educational materials. (P. Ampah, personal communication, January 9, 2025)*

Another key insight was that immediate accessibility to preventive tools after watching the animation enhanced action-taking. Health officers found that in cases

where mosquito nets were distributed immediately after screening the animation, people were more likely to install and use them properly. This reflects the AIDA Model's urgency principle, which suggests that action is more likely when the opportunity to implement new knowledge is immediate (Lewis, 1898).

*The best time to give out mosquito treated nets is right after watching this animation video. When people feel motivated, they should be able to act on it right away. In this case, they were motivated because some asked to be given nets. (P. Amoako, personal communication, January 9, 2025)*

The animation has demonstrated a remarkable ability to inspire active reflection and meaningful audience engagement. Health officers observed that its delivery encouraged thoughtful response and increased attentiveness to key prevention behaviours, fully aligning with CTML's active learning principle, which recognises interaction as a powerful catalyst for retention and application (Mayer, 2014).

*This animation is very good and educative. It really gets people thinking and encourages them to respond seriously to Malaria prevention. (T. Anane, personal communication, January 14, 2025)*

The animation continues to energise Malaria education efforts across various platforms. Health officers shared how its resonance within the Effutu communities extends beyond the initial viewing, supporting sustained awareness and community mobilisation. Its presence in community centres, durbars, and outreach activities has enhanced public health engagement and expanded access to vital knowledge.

*"Some people are excited right after watching, but after a while, they may go back to their old habits. We have to show this animation at the community centres, during Malaria education durbars and even, as nurses, we should have this animation on iPads to show to the community members whenever we go on Malaria education outreach programmes." – (V. Hannah, personal communication, January 14, 2025)*

Through consistent reinforcement and widespread integration into local health education programmes, the animation has become an essential tool for deepening Malaria prevention efforts and sustaining long-term behaviour change. This aligns with CTML's cognitive load theory, which suggests that sustained behaviour change requires repeated exposure to new information and the opportunity for practice (Sweller, 2010). To address this, health officers recommended pairing the animation with hands-on Malaria prevention workshops, role-playing scenarios, and real-life demonstrations. B. Raymond avers that;

*The message is very clear. "If they practice with us, setting up nets or identifying mosquito breeding areas, it will stick with them better. (B. Raymond, personal communication, January 9, 2025)*

Additionally, some health officers expressed concerns about the lack of adaptation to different age groups. They suggested that a version tailored specifically for children – with more playful elements and repetition of key points – could further reinforce long-term learning. Research on CTML's age-appropriate learning design suggests that educational materials should be adapted to the cognitive development stage of their target audience to maximize impact (Mayer, 2014).

*Children learn differently from adults. If we had a version with songs or simple repetition, they would remember it better. (T. Anane, personal communication, January 14, 2025)*

The animation effectively encouraged preventive action through clear behavioural modelling, repetition, and reinforcement strategies. However, challenges related to sustained behaviour change, interactivity, and adaptation to different learning groups highlight the need for ongoing community engagement, interactive learning methods, and repeated exposure to maximize its long-term impact. Strengthening these

areas would further align the animation with CTML's emphasis on active engagement and the AIDA Model's focus on actionable health education.

In conclusion, this section of the study evaluated the effectiveness of a Malaria education animation developed for the Effutu community, based on feedback from health officers. The animation was assessed using the AIDA Model (Attention, Interest, Desire, Action) and the Cognitive Theory of Multimedia Learning (CTML).

The animation successfully captured attention through engaging visuals, culturally relevant settings, sound effects, and dynamic storytelling. However, some older viewers found the pacing too fast, suggesting a need for slower transitions or pauses. The narrative format and relatable characters-maintained audience interest, with emotional and humorous elements enhancing engagement. Health officers recommended diversifying storylines to sustain interest over repeated viewings.

The animation effectively created a desire for behavioral change by showcasing realistic consequences of Malaria and demonstrating preventive measures. Challenges included overcoming habitual resistance and cultural misconceptions, requiring additional reinforcement strategies. The animation encouraged short-term preventive actions, such as proper net usage, but sustaining long-term behaviour change remained a challenge. Health officers suggested follow-up screenings, interactive discussions, and immediate access to preventive tools to reinforce messages.

Overall, the animation was praised for its educational impact but requires adjustments in pacing, repeat viewings, interactive elements, and adaptations for different age groups to maximise its effectiveness. Community engagement and repeated exposure were emphasised as crucial for lasting behaviour change.

## CHAPTER SIX

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 6.0 Overview

This study focused on examining the modes, channels and processes used for communicating the preventive measures of Malaria to develop a persuasive animation with the spoken local language of the people to increase awareness of Malaria prevention in Effutu communities in the Central Region of Ghana. The study further examined the perspectives and experiences of the health officers and community folks about the use of animation during Malaria education. This final chapter deals with the summary of findings, conclusions reached in the study, and the recommendations and directions for future research studies.

#### 6.1 Summary of Findings

Using a qualitative research design, the investigation addressed four (4) research questions: (1) the modes and channels utilized for communicating preventive measures of Malaria and the dominant visual materials available; (2) the development of a contextually tailored Malaria education animation; (3) how community dwellers interpret the communication and persuasive elements of the animation; and (4) the perspectives of health officers regarding the developed animation. Data collection methods included in-depth interviews with ten (10) health officers, ten (10) community dwellers, and two (2) animation experts, direct observations at health facilities and community centers, and feedback responses involving community dwellers and health officers.

The first research question examined the modes and processes, and the dominant visual communication materials available for communication during Malaria

education. The findings explore the communication strategies used for Malaria prevention education in the Effutu Municipality. The study identified Health Education Campaigns, Visual Communication Cues, and the use of Indigenous Language as the three (3) overarching themes. Health officers conducted community health education through Home Visitations, Health Talks at Community Information Centers, Community Radio Discussions, and Community Durbars. These channels enabled targeted outreach to diverse groups, including pregnant women at maternity wards, patients in outpatient departments, and households via home visits. The multi-channel approach aligned with the AIDA model's Attention and Interest components, ensuring that information about the causes, symptoms, and prevention of Malaria reached captive and wider audiences effectively.

Visual Communication Cues emerged as another critical theme. Traditional materials such as posters, brochures, and leaflets remain foundational, given their durability in clinic and community settings. However, health officers also integrated dynamic media such as radio announcement and talk shows, social media images, and self-downloaded animated videos on mobile devices to engage both auditory and visual processing channels. Demonstrations of insecticide-treated net installation and environmental sanitation practices further reinforced learning through worked examples and active participation. Community testimonies confirmed the memorability and clarity afforded by these visual cues, underlining the multimedia principle that words paired with pictures enhance comprehension.

A third theme, Indigenous Language in Malaria Communication, highlighted the predominance of Fante, supplemented by Effutu, Twi, and English. Health professionals adapt language choices based on audience proficiency and context, leveraging conversational local dialects to reduce extraneous cognitive load and

facilitate message uptake. Community members consistently reported higher engagement and understanding when information was delivered in Fante, with clear transitions when multilingual explanations were necessary. This language strategy reflects the personalization and limited-channels assumptions of Cognitive Theory of Multimedia Learning (CTML), optimising working memory resources for processing health content rather than translating foreign-language messages.

Building on these findings, the second research question explored the development of a persuasive animation tailored to Effutu communities. Input from health officers, community dwellers, and two (2) animation experts shaped the core message and design parameters. Participants emphasised that the animation's central objective should foreground Malaria Pathophysiology, environmental cleanliness, avoidance of self-medication, and consistent use of insecticide-treated nets (ITNs). Expert guidance underscored three persuasive elements: Familiar Environment and Names, Humorous Statements, and Original Local Tunes. Naming the protagonist "Nenyi," replicating local landmarks (such as the Trauma and Specialist Hospital), and embedding scenes of Winneba's marketplaces and family compounds fostered cultural resonance and immediacy. Strategic humour like gentle mockery of stubborn behaviour lowered defensive barriers and heightened receptivity, while authentic Effutu rhythms and Fante narration strengthened emotional engagement and long-term memory encoding. Together, these design choices created an educational narrative that balanced cognitive load management with cultural authenticity.

The third research question investigated how community dwellers interpret the animation's communication and persuasive elements. Three (3) themes emerged: Visual Comprehension and Cultural Resonance, Message Clarity and Information Processing, and Emotional Engagement and Persuasive Impact. Participants reported

immediate recognition of local settings, characters, and traditional storytelling patterns, which served as cognitive scaffolds guiding attention to key health information. The animation's cause-and-effect narrative structure depicting mosquito breeding in gutters, bites in market scenes, and illness progression due to self-medication aligned with the signalling, spatial contiguity, and modality principles of CTML. Feedback revealed that subtle design choices, such as showing relatively clean gutters to challenge misconceptions, promoted conceptual change and scaffolded guided discovery.

Emotional engagement proved pivotal: using Effutu mockery, suspenseful sound effects, and lifelike character expressions invoked amusement, frustration, fear, and empathy in rapid succession. Community dwellers described how these emotions reinforced the seriousness of Malaria while maintaining viewer interest. Scenes illustrating Nenyi's pride, subsequent infection, and tragic demise prompted personal reflection on habits and familial responsibilities. The integration of humor, fear appeals, and local music created optimal arousal levels for learning, maximising germane processing and schema construction.

The final research question centered on health officers' perspectives of the completed animation. Across the AIDA stages, officers noted that vibrant visuals and dynamic audio immediately captured attention, with cultural landmarks eliciting exclamations of surprise and recognition. Story-driven pacing sustained interest, while narrative cohesion and suspenseful reveals enhanced comprehension of Malaria's transmission and treatment pathways. The animation generated desire for behavioral change by modeling preventive actions such as distilling gutters, proper net installation, environmental spraying and leveraging the Extended Parallel Process Model to balance threat and efficacy messages. Officers recommended follow-up screenings, interactive discussions, and community screenings with on-site ITN distribution to translate desire

into sustained action. They emphasized the necessity of repetition, spaced reinforcement, and practical demonstrations to counter habituation and the forgetting curve.

Collectively, the findings demonstrate that a multifaceted, culturally grounded multimedia intervention can substantially elevate Malaria education outcomes. By interweaving interpersonal outreach (home visits, talks, radio), visual and animated storytelling, indigenous language, and participatory design, the animation serves as a scalable model for community-based health communication. The study's integration of AIDA and CTML frameworks provides a robust theoretical foundation, showing how attention, interest, desire, and action can be guided through cognitive principles of multimedia learning.

The participatory development approach demonstrated that community engagement in educational tool creation enhances ownership, acceptance, and effectiveness. Health education is most effective when it empowers communities as co-creators of knowledge rather than passive recipients. When interventions are built with, rather than for, communities, they carry the imprints of local wisdom, priorities, and aspirations, enhancing their relevance, credibility, and sustainability.

Finally, this study affirms that effective health communication must transcend didactic information transfer. It must create emotional experiences, culturally resonant narratives, and cognitively accessible messages. Health interventions like the Effutu Malaria animation represent the future of public health education; empathetic, evidence-based, culturally tailored, and designed not just to inform, but to transform communities from within.

## 6.2 Conclusions

This research has undertaken a comprehensive examination of Malaria education strategies within the Effutu Municipality, synthesizing empirical data, theoretical frameworks, and participatory design approaches to inform both scholarly discourse and practical intervention efforts. Grounded in four (4) interrelated research questions, the study mapped existing communication channels and visual materials, orchestrated the co-creation of an indigenous animated tool, assessed community interpretations of the animation, and gathered health officers' evaluative perspectives. Through this multifaceted methodology, the research achieved several objectives: it illuminated the strengths and limitations of current educational campaigns, highlighted the cognitive and cultural mechanisms underpinning message reception, and demonstrated the feasibility and impact of culturally tailored multimedia interventions. The following conclusion distills these insights, articulates their broader implications, acknowledges research constraints, and outlines avenues for future inquiry.

Firstly, the identification of primary communication modes and channels such as face-to-face home visitations, community information centre talks, hospital-based health sessions, radio discussions, and community durbars underscores the importance of hybrid outreach strategies. Health officers leverage each medium's unique affordances: home visits facilitate personalised dialogue and address individual queries; community centre talks harness collective attention in neutral, accessible venues; hospital-based sessions capitalise on captive patient audiences; radio broadcasts extend reach to remote listeners; and durbars foster social validation through public ceremonies. This pluralistic approach aligns with Ghirvu's (2013) AIDA model by systematically generating Attention, Interest, Desire, and Action across sequential touchpoints. It also mirrors Vakratsas and Ambler's (1999) emphasis on attention-

grabbing presentations and Dahlen et al.'s (2010) recommendations for multi-format engagement.

Secondly, the study's deep engagement with visual communication materials highlighted the enduring value of static aids like posters, brochures, leaflets complemented by dynamic modalities such as animated videos, radio announcements, and social media imagery. Static materials provide tangible, persistent reminders in clinics and communal spaces, facilitating repeated passive exposure. Yet, their efficacy is contingent upon design quality: clear typographic hierarchies, high-contrast colour palettes, unambiguous iconography, and culturally resonant visuals. The integration of dynamic media addresses cognitive processing principles articulated by Mayer (2005), particularly dual-channel processing, spatial contiguity, and signaling. Radio segments activate auditory channels concurrently with visual cues, reinforcing message retention. Self-downloaded mobile animations extend learning beyond formal encounters, offering on-demand, self-paced opportunities for review. These findings affirm the multiple representation principle (Ainsworth, 2008) and underscore the necessity of aligning material design with both cognitive load management and cultural aesthetics.

A third critical insight pertains to the strategic use of indigenous languages primarily Fante, supplemented by English to minimize extraneous cognitive load and leverage conversational accessibility. Rooted in Mayer's (2014) personalization and voice principles, this linguistic adaptation acknowledges that working memory capacity is limited and that unfamiliar linguistic processing diminishes resources available for message encoding. Health officers reported markedly higher engagement during Fante-language sessions, with community members validating improved comprehension and retention. Conversely, multilingual switching introduced split-attention challenges when not explicitly signaled, highlighting the need for linguistic coherence and

transition cues. These findings resonate with at least two (2) cognitive load theory dimensions: intrinsic load, determined by material complexity and learner expertise, and extraneous load, influenced by presentation format. By foregrounding a dominant local dialect, the intervention optimises germane cognitive load, directing mental effort toward constructing meaningful schema rather than overcoming language barriers.

The participatory development of the Malaria education animation constituted the study's second research phase, emphasising community-driven content co-creation. Health officers, community dwellers, and the animation experts contributed iterative feedback to refine core messages like Malaria pathophysiology, environmental cleanliness, insecticide-treated net usage, and prompt treatment seeking. Expert recommendations stressed the importance of cultural authenticity: employing local character names such as 'Nenyi', recreating recognisable landmarks like the Trauma and Specialist Hospital, integrating indigenous humour, and layering original Effutu musical motifs. These elements collectively fostered emotional resonance and social presence, as emphasised in Mayer's embodiment and voice principles. By involving end-users in storyboarding, voice casting, and asset selection, the research upheld participatory design tenets, enhancing perceived ownership and relevance. Moreover, community validation sessions mitigated potential cultural misalignments, ensuring the animation transcended mere informational content to become a reflective mirror of lived experiences.

Exploration of community interpretation, Research Question Three revealed that visual comprehension and cultural resonance operate as powerful cognitive scaffolds. Participants consistently reported instant recognition of environmental markers, social rituals, and familial structures, which anchored attention and facilitated integration of new health information. The split-attention principle (Ayres & Sweller,

2014) was meticulously balanced by synchronising audio narration with corresponding visual elements, preventing cognitive overload. Furthermore, emotional engagement emerged as a pivotal mechanism for persuasion. The animation's nuanced use of Effutu-style mockery elicited laughter, frustration, and empathetic concern within seconds, fostering a robust emotional arc that echoed Renkl's (2014) work on generative learning. Instances of humor interspersed with fear appeals created optimal arousal levels for memory encoding, corroborating Mayer and Estrella's (2014) findings on emotional engagement in multimedia learning. Community dwellers' testimonials indicated that emotional salience, combined with cultural familiarity, cemented preventive behaviours more deeply than abstract warnings.

Health officers' perspectives on the final animation in Research Question Four further substantiated its impact across the four (4) AIDA stages. Attention was captured through bold colour contrasts, dynamic visual transitions, and suspenseful sound cues; interest was sustained by storyline pacing, relatable character dilemmas, and narrative coherence; desire for behaviour change was nurtured by modeling correct preventive actions such as insecticide treated net hanging, environmental sanitation, and immediate healthcare consultation, and reinforced by emotional appeals linked to familial well-being; and action was catalysed when screenings were paired with practical demonstrations and treated net distributions, echoing Witte's Extended Parallel Process Model (1992). Officers recommended integrating post-screening interactive discussions and periodic refresher viewings to reinforce message retention and translate knowledge into habitual practice. These collective insights underscore the multifactorial pathways through which multimedia interventions can effectuate sustained behaviour change.

The theoretical contributions of this research extend beyond its immediate empirical context. By integrating cognitive load theory (Sweller et. al., 1998), Mayer's CTML (2014), and the AIDA model (Lewis, 1898; Ghirvu, 2013) into a cohesive evaluation framework, the study demonstrates how classical advertising principles and learning theories can be synergistically applied to public health education. This cross-disciplinary synthesis bridges gaps between marketing communications, instructional design, and health promotion. The findings validate CTML's multimedia, signaling, and personalization principles in low-resource, rural settings, and propose refinements to the AIDA model by incorporating cultural and linguistic variables as core determinants of attention and desire. Such theoretical integration offers a scalable blueprint for other health domains, suggesting that contextually grounded animations can complement traditional outreach in diverse cultural milieus.

Practically, this research yields actionable insights for policymakers, health agencies, and international donors. Firstly, investment in participatory, locally tailored multimedia productions can yield higher return on investment compared to generic mass media campaigns. Secondly, coupling animation screenings with on-the-ground resource distribution such as insecticide treated nets and sanitation kits maximises the conversion of awareness into action. Thirdly, training modules for environmental health officers should incorporate multimedia facilitation skills, emphasising technical operation, audience engagement strategies, and post-screening reinforcement techniques. Fourthly, strategic partnerships with community radio stations and social media channels can extend the animation's reach, offering shareable content for mobile platforms and group messaging services. These recommendations align with WHO's call for integrated vector management and community participation, underscoring that communication strategies must be as multifaceted as the communities they serve.

Despite its strengths, this study contends with limitations that warrant consideration. The animation's evaluation focused primarily on immediate cognitive and emotional responses, with limited longitudinal tracking of behaviour adoption and Malaria incidence. Reliance on self-reported data introduces potential social desirability bias, as participants may overstate compliance. The study's geographic scope limited to selected health centers in the Effutu Municipality constrains generalisability across varied Ghanaian districts. Further, the production timeline and budget constraints precluded extensive iteration cycles, possibly limiting refinement opportunities. Recognising these constraints, future implementations should integrate rigorous impact evaluations, including randomised controlled trials and objective health outcome measurements, to substantiate long-term efficacy and scalability.

In sum, this research confirms that culturally relevant, multimedia-driven educational animations, embedded within multi-channel outreach frameworks, can significantly strengthen Malaria prevention efforts. By honoring local languages, leveraging indigenous humor, and modeling actionable behaviours, the intervention achieved a delicate balance between cognitive optimization and emotional resonance. The confluence of CTML and AIDA frameworks provided a rigorous evaluative lens, while participatory co-creation ensured cultural legitimacy and community ownership. As Malaria remains a persistent public health challenge, particularly in resource-constrained settings, the study offers both a replicable methodology and a compelling case for investing in contextually tailored, theory-informed multimedia strategies that catalyze enduring behaviour change and advance global health equity.

### 6.3 Recommendations

Based on the above conclusions, the study recommends the following;

1. Indigenous language integration should be strengthened through the development of standardized Malaria prevention terminology in Fante and other relevant indigenous languages to ensure consistency across all health education materials. A formal training programme for health professionals organized by Ghana Health Service should be created focusing on effective communication through indigenous languages, including cultural context and designing of culturally-specific visual aids that reflect local environments, practices, and people to increase relatability and engagement. Additionally, establishing a certification process for health communicators who demonstrate proficiency in delivering technical health information in indigenous languages would further enhance quality and consistency.
2. Animators and health officers who are charged to develop health educational multimedia (Animation) contents should consider inculcating tenets of AIDA Model, Cognitive theory of Multimedia Learning principles and other models as a guide while during the pre-production and production stages. This approach will ensure that content design and persuasive elements are driven by the likely decision-making of the consumers of the multimedia work. These models if considered will guide animators to select vibrant colours and use powerful visuals during the preproduction and production stages. The study further recommends the essence of involving the target audience right from the inception of the idea and to its finality to enhance inclusivity, ownership and sustainability.

3. Sustained behaviour change requires more than a single exposure; it demands ongoing reinforcement through social and environmental supports. The study recommends implementing a structured schedule of community viewings followed by facilitated Question and Answer sessions, peer-to-peer testimonials, and demonstration workshops. Environmental Health Officers should coordinate with community opinion leaders, local chiefs, and women's groups to host periodic "Malaria Education Days," where the animation is screened, and practical skills such as proper insecticide treated net hanging, gutter cleaning, and insecticide spraying are practiced on-site right after every session. Additionally, creating "Malaria Clubs" in schools and youth centers will engage younger ones in peer education, ensuring that prevention messages ripple through households and social networks. Regular follow-up visits by health volunteers can provide accountability, address challenges, and sustain motivation over time.
4. Health Officers should be equipped with electronic gadgets such as Ipads, social media friendly devices and etc to display the animation to the community dwellers when going on Malaria Education outreach programmes. This will enhance and simplify the education. Also, to complement in-person and broadcast approaches, a well-developed mobile-friendly distribution strategy that includes short animation video snippets, animated GIFs, and audio clips optimised for WhatsApp, Facebook and other apps should be made available to health officers. These micro-learning assets extracted from the main animation should highlight key behaviours, rhythmic jingles, and memorable dialogue fragments. Partner with telecom providers to zero-rate or subsidise data access for health content, and collaborate with community influencers to share content

through social media channels. Implement an SMS reminder system that syncs with viewing schedules, sending timely prompts to households about next screenings or net maintenance tips. Establish a basic mobile application that offers an offline viewing mode, segment selection, and push notifications for upcoming community events.

5. Future research should explore adaptive animation platforms that personalize content based on real-time analytics, such as viewer age, literacy level, and prior exposure. Other studies may also look at using mixed method research approach or quantitative research approach to evaluate the effectiveness or impact of Malaria Education Animation among a large group of participants.



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## APPENDICES

### APPENDIX A

 UNIVERSITY OF EDUCATION, WINNEBA  
SCHOOL OF CREATIVE ARTS  
DEPARTMENT OF MUSIC EDUCATION  
P.O. Box 25, Winneba, Ghana  
+233 (03323) 22030 / (020) 2041084  
dme@uew.edu.gh

OUR REF: SCA/DME/1.1/VOL.2/102

YOUR REF: 20<sup>th</sup> June, 2023

**TO WHOM IT MAY CONCERN**

Dear Sir/Madam,

**LETTER OF INTRODUCTION**  
**STEPHEN OSEI AKYIAW**

I write to introduce, Mr. Stephen Osei Akyiaw, a Ph.D student of the Department of Music Education, University of Education, Winneba, who is conducting a Research on the topic: *"Animation: Footpath for Enhanced Awareness Creation on Malaria Prevention in Rural Communities in Ghana"*. Please, this research and information is for academic purposes only.

I would be very grateful if you could give him the assistance required.

Thank you.

Yours faithfully,



**DR. (MRS.) AUGUSTA ARKO-MENSAH**  
**AG. HEAD OF DEPARTMENT**

## APPENDIX B

### PRE-STUDIO RESEARCH

#### INTERVIEW GUIDE FOR COMMUNITY DWELLERS

1. Please, what language do you speak and understand?
2. How do you get information on Malaria and its prevention?
3. Which mass media aid is used to give you information on Malaria and its prevention?
  - a.  Radio
  - b.  Television
  - c.  Poster
  - d.  Billboard
  - e.  Newspaper/Magazine
  - f.  Brochure/Leaflet
  - g.  Animation/cartoon
  - h.  Other .....
4. Which language/s is/are used to give or share information on Malaria?
5. Which language/s is/are used to give or share information on Malaria through the mass media?
6. Would you prefer receiving information on Malaria prevention in your local language depending on the mass media used?
7. What are the causes of Malaria?
8. How can Malaria be prevented?
9. Have you ever seen animation used as a means of communication to provide information on any health-related disease on television or any visual display device before? If yes, which health related disease was that?
10. Would you prefer to see an animation/cartoon used as a means to provide information on Malaria and its prevention in your local language? Why?

## INTERVIEW GUIDE FOR COMMUNITY HEALTH OFFICER

1. How do you disseminate information on Malaria and its prevention?
2. Which mass media aid do you use to give information on Malaria and its prevention to the community dwellers?
  - a.  Radio
  - b.  Television
  - c.  Poster
  - d.  Billboard
  - e.  Newspaper/Magazine
  - f.  Brochure/Leaflet
  - g.  Animation/cartoon
  - h.  Other .....
3. Which language/s do you use to give or share information on Malaria?
4. Which language/s do you use to give or share information on Malaria through the media state above?
5. Would you prefer receiving information on Malaria prevention in your local language depending on the mass media used?
6. What are the causes of Malaria?
7. How can Malaria be prevented?
8. Have you ever used animation/cartoon to provide information on any health-related disease to community dwellers using any visual display device before?  
Why
9. Which health related disease was that?
10. Would you prefer to provide information on Malaria and its prevention using an animation/cartoon as an alternative form of education in a local language on a visual display device? Why?

## PREPRODUCTION RESEARCH

### **Part 1: Health Officers**

7. What core messages regarding Malaria should be promoted and why?
8. What should be the main objectives of the message and why?
9. What are the recommended preventive measures of Malaria?
10. What message source factors need to be considered in the animation/cartoon?
11. Which language will you prefer the animation to use as its voiceover, and why?
12. How would you want the community dwellers to feel after watching the animation/cartoon?

### **Part 2: Community Dwellers**

1. What core messages regarding Malaria should be promoted and why?
2. What should be the main objectives of the message and why?
3. What are the recommended preventive measures of Malaria?
4. What message source factors need to be considered in the animation/cartoon?
5. Which language will you prefer the animation/cartoon to use as its voiceover, and why?
6. What benefits will you get if you follow the recommended messages?

## **STUDIO RESEARCH GUIDE**

1. How can the message sources (actors) be structured and constructed to attract attention and appeal to the audience?
2. How can lighting and other misc-en-scene elements be constructed to drive the educational narrative of core messages?
3. What camera framing, angles and shots can be deployed to visualise message persuasively and to appeal to audiences?
4. How can sound design be used to support visual content, and what editing methodology will ensure effective communication and learning?

### **Interview Guide for Educational Video Experts**

- a) How appropriate are the visual forms, communication elements, compositional styles and persuasive strategies?
- b) How appropriate are the persuasive elements in the animation?
- c) What else could be done to improve the communicative value in the animation?

## **POST-STUDIO RESEARCH**

### **Interview Guide for Health Officers**

#### **PART A**

1. How accurate is the message content?
2. Does the content reflect the recommended preventive measures of Malaria?
3. Is the message clear and understandable?
4. Is any of the information misleading or missing?
5. What do you think about the fear/threat mentioned in the animation/cartoon? Why?
6. How do you feel about the efficacy elements?
7. What part of the animation is interesting to you?

#### **PART B**

1. How effective is the animation/cartoon? In terms of content, language, characters, environment, images, sound and others?
2. How will the use of this animation/cartoon improve your Malaria education sessions?
3. Is there anything that can make the animation challenging to use?
4. How easy or difficult will it be to access this animation/cartoon and use it when providing education? Why
5. How easy was it when using this animation/cartoon to educate community folks on Malaria?
6. How did the animation improve your sessions with your community folks?
7. What are your general impressions about the animation?

#### **PART C**

1. How did the animation help you to accomplish more tasks quickly?
2. Which areas? Can you please give examples and Why?
3. How did the animation increase your productivity as a public health officer?
4. How did the animation help your delivery to be more effective?
5. How did the animation help improve the Malaria education sessions?
6. How did your community folks receive the animation?

## POST-STUDIO RESEARCH

### Interview Guide for Community Folks

- a. Please what is this animation about?
- b. What do you like about the animation?
- c. Have seen an animation like this before?
- d. Please did you see the scenes in the animation?
- e. What do they mean or represent?
- f. How do you feel about what the health officer said during these scenes?
- g. Do you believe them? Why?
- h. Does this animation remind you of any experiences?
- i. How do you feel about the animation in general?



**APPENDIX C****OBSERVATION CHECKLIST**Name of Researcher: **Stephen Osei Akyiaw**Name of Research Project: **Animation: A Footpath for Enhanced Awareness****Creation of Malaria prevention in Effutu Communities**Location: **Winneba**Time: **30 Minutes**Contact Details of Researcher: [soakyiaw@uew.edu.gh](mailto:soakyiaw@uew.edu.gh) +233243328821

SN	CRITERION	YES	NO	REMARKS
1.	Are viewers focused on the animation?			
2.	Do viewers show signs of distraction (e.g., talking, checking phones, looking away etc.)?			
3.	Do viewers seem interested or curious?			
4.	Is there visible excitement or surprise during key moments?			
5.	Do viewers display confusion or ask questions about Malaria after the animation?			
6.	Do viewers appear to understand the keys concepts of Malaria (causes, prevention etc.)?			
7.	Do viewers seem to recognize the importance of Malaria prevention (e.g., use of nets, cleanliness etc.)?			
8.	Which scenes had the most interest of the viewers?			
9.	Did the viewers appreciate the humour components of the animation?			

10.	Is there any laughter, shock or surprise during specific moments in the animation?			
11.	Did the viewers engage in conversations about Malaria with others during and after viewing the animation?			
12.	Did viewers seem to find the animation engaging and informative?			



## APPENDIX D

### INFORMED CONSENT FORM FOR RESEARCH PARTICIPATION

**Study Title:** Animation: A Footpath for Enhanced Awareness Creation of Malaria prevention in Effutu Communities

**Name of Researcher:** Stephen Osei Akyiaw

**Contact Information:** [soakyiaw@uew.edu.gh](mailto:soakyiaw@uew.edu.gh) +233243328821

**Name of Principal Supervisor:** Dr. Ebenezer Acquah

**Name of Co- Supervisor:** Dr. Joseph Essuman

Dear Research Participant,

You are invited to participate in a research study conducted by Stephen Osei Akyiaw, a PhD candidate at the Department of Music Education, School of Creative Arts, University of Education, Winneba.

Before you decide whether to participate, I kindly request that you carefully read and understand the information provided in this consent form. This form outlines the purpose, procedures, potential risks and benefits, and confidentiality arrangements associated with this study.

#### ***Study Purpose:***

The purpose of this study is to develop an animation in Fanti language orientation to enhance awareness creation to prevent diseases in communities in Effutu Communities in the Central Region of Ghana. The animation having its voice-over in the Fanti language of the indigenous people is very important to help with easy understanding of the message in the animation. The study further looks at examining how the community dwellers and health officers interpret the communication and persuasive elements used to develop the animation and their perspectives.

#### ***Study Procedures:***

If you choose to participate in this study, you will be requested to:

1. Engage in an in-depth interview with the researcher, which will involve discussing the modes and channels used to communicate the preventive measures of Malaria and also know your perspective about the developed Malaria Education Animation for the Effutu Communities.
2. Grant permission for the researcher to audio-record the interview sessions for accurate data collection and analysis purposes.

#### ***Potential Risks and Benefits:***

Participating in this research study does not involve any physical risks. However, you may choose to skip or avoid answering any questions that you find uncomfortable.

By participating in this study, you contribute to the body of knowledge on how preventive measures of Malaria are disseminated in Effutu Municipality. While there are no immediate personal benefits, the findings of this research may enhance awareness creation of preventive measures of Malaria using animation in Effutu communities.

***Confidentiality:***

Your participation in this study will remain strictly confidential. All data collected will be de-identified and stored securely. Only the researcher and authorised members of the research team such as the research supervisors will have access to the data. Research findings will be reported in a manner that ensures your anonymity. Your name or any identifying information will not be used in any publication or presentation arising from this research study.

***Voluntary Participation:***

Participation in this research study is entirely voluntary. You have the right to refuse to participate or withdraw your consent at any time without penalty or prejudice. Your decision to participate or not will in no way affect your relationship with the School of Creative Arts, UEW or any associated parties.

***Consent:***

By signing below, you confirm that you have read and understood the information provided in this consent form. You voluntarily agree to participate in the research study on, **Animation: A Footpath for Enhanced Awareness Creation of Malaria prevention in Effutu Communities**. You understand that you may withdraw from the study at any time without penalty by notifying the researcher.

Participant's Signature:.....

Date:.....

Thank you for considering to be a participant in this research study.

If you have any questions or concerns regarding the study, please feel free to contact Stephen Osei Akyiaw, using the email address, [soakyiaw@uew.edu.com](mailto:soakyiaw@uew.edu.com) or phone number +233243328821.

Sincerely,

Stephen Osei Akyiaw

*(PhD Candidate, Department of Music Education, UEW)*