

Kwame Nkrumah University of Science and Technology

Reporting Verb Usage in Academic Discourse: A Study of the English, Mathematics
and the Agricultural Disciplines

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This thesis submitted to the Department of English of the College of Humanities and Social Sciences, Kwame Nkrumah University of Science and Technology, in partial fulfillment of the requirements for the award of Master of Philosophy Degree in English

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DECLARATION

I hereby declare that this thesis, with the exception of the references to properly cited works, is the result of my own original research, conducted under the guidance of Dr. Obed Nii Broohm, and that it has not previously been submitted in whole or in part for another degree.

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DEDICATION

To my parents, Mr. and Mrs. Kwakye

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I wish to express my sincere thankfulness to God Almighty for giving me the strength and good health required to complete this research.

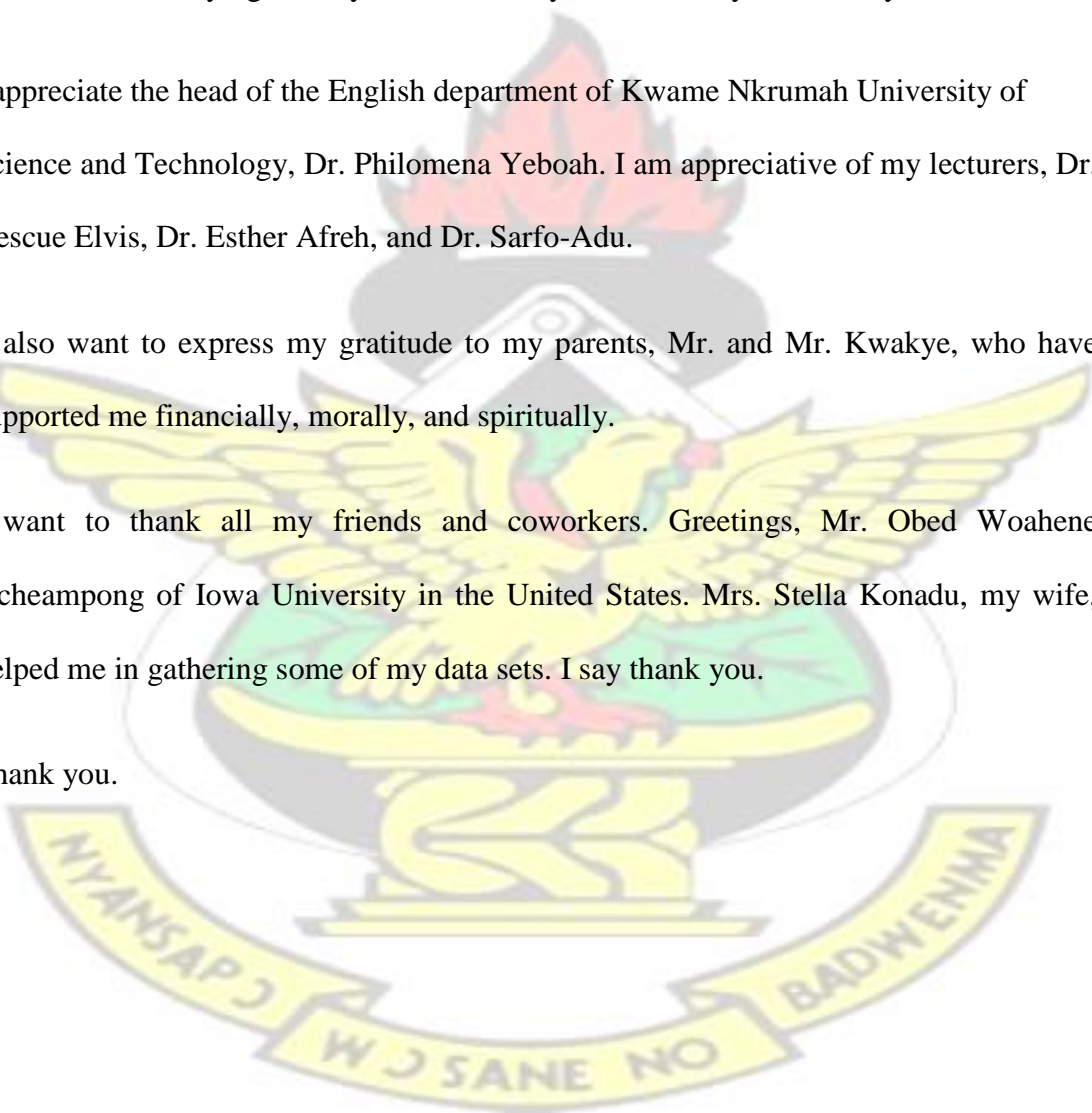
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ABSTRACT

This research work analyzes the categories of reporting verbs employed in the literature review chapters of scholarly writings in master of philosophy theses in Agriculture, English and Mathematics departments in the Kwame Nkrumah University of Science and Technology. The mixed method technique was employed for data collection. The sample was selected with the help of the simple random sampling method with a purpose. Forty-five (45) master of philosophy theses made up the study's entire sample. The first research question was analyzed using a quantitative approach to data analysis, and results were given as numbers and percentages. The second and third research questions underwent qualitative analysis. The organization of the data for analysis typically employed the descriptive, content, and inductive analysis. According to the study, the literature review chapters of master of philosophy theses in Agriculture, English and Mathematics employed the discourse, research and cognitive acts verbs. They employed them in varying degrees. In all, discourse acts verbs were the highest with respects to number of occurrences. This was followed by research act and cognitive act verbs respectively. The results indicate that in the English data, discourse acts were the highest followed by research and cognitive act verbs. As far as mathematics data is concerned, research acts were the highest followed by discourse and cognitive acts. In the agriculture thesis, discourse act was the highest followed by research act and cognitive act verbs. According to the analysis, the usage of reporting verbs in the literature review chapters of the theses in Agriculture, Mathematics and English serves a variety of purposes,

including the statement of findings, countering of fact, statement of procedures, indication of writer's opinion about a proposition, and others. The study identified that point of view, institutional culture and aim of the writing all affect how reporting are employed when writing theses.

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ABBREVIATIONS

KNUST	Kwame Nkrumah University of Science and Technology
M. Phil	Master of Philosophy
PhD	Doctor of Philosophy
LRs	Literature Reviews
EFL	English as Foreign Language



CHAPTER ONE

GENERAL INTRODUCTION

1.0 Introduction

Reporting verbs as verbs employed to refer to original sources or introduce borrowed information in academic writing (Houge & Oshima, 2006). A preliminary survey conducted among graduate students in public universities in Ghana suggests that the postgraduate level Research Methods course taught does not typically teach graduate students the type of reporting verb to use at what instance. This generally means that postgraduate students in different fields of study may not be sure of the appropriate reporting verb to use when writing their theses in their fields in their various tertiary institutions. Research method class and thesis guides/manuals available typically provide very little information on reporting verb usage in academia. The present study deals with reporting verb usage in the literature review section of some selected M. Phil theses from the Kwame Nkrumah University of Science of Technology (KNUST). In this chapter we offer a general introduction (section 1.0) to the study, and discuss other pertinent issues such as the background to the study (section 1.1), the problem statement (section 1.2), the significance of the study (section 1.3), the objectives of the study (section 1.4), research questions (section 1.5), scope of the study (section 1.6), justification of the study (section 1.7), organization of the study (section 1.8).

1.1 Background to the Study

In academic research reports and writing, there is a specific rhetorical structure or generic structure that every research report is expected to follow. The structure of an academic research report comprises Abstract, Introduction, Literature Review,

Methodology, Results, Discussions of Results, and Conclusion (Bitchener, 2010). The introduction and literature review aspects are key aspects that require the researcher to make reference to previous works related to the present research. Researchers have to cite previous works to avoid plagiarism as it is an unpardonable offence in academic writing. In doing so, researchers use a particular type of verb to report or make reference to previous works. Yeganeh and Boghayeri (2015) indicate that citation helps researchers to make reference to disciplinary community to which they belong and also show how they understand the previous works. In a section titled “Literature Review”, citations are generally found (Soler-Montreal and Gil-Salom, 2011).

The literature review and introduction sections provide a general overview of the research, explain the definitions and terms parallel within the study’s context (Ridley, 2012). The lacuna may be areas that have not been researched that the researcher wants to work on. In order to do this well, the writer must support his/her claims with existing statements, in which citations are typically used to serve as foundation on which the research will be conducted.

To do a very good citation and to avoid plagiarism in research writing, reporting verbs are used. Charles (2006) indicates that reporting verbs help writers of research reports to indicate their responsibility towards the assertion made. Reporting verbs help writers to make reference to existing literature to support their claims. Reporting verbs have been classified into different types by different scholars. Thompson and Ye (1991) and Hyland (1999; 2002) have all classified reporting verbs into different types. Thompson and Ye (1991) used a corpus-based method in their research to study more than a hundred introduction sections of journals in different fields and used that to classify reporting verbs in relation to their semantic distinctions. They group reporting verbs into denotation and evaluation types. Under the denotation type, there are author acts and

writer acts. Under the evaluation type also, there are writer's stance, author's position and writer's meaning. In an effort to identify cross-disciplinary disparities in the area of citation, Hyland (1999) also looked into eighty (80) research papers from various disciplines. He proposed denotation and evaluation types of reporting verbs. Under denotation, he proposed research acts, cognition acts, and discourse acts. Under evaluation types also, he proposed factive, non-factive and counter-factive types.

The selection of specific reporting verbs in context poses a difficult problem for both students and lecturers. From the students' perspective, the selection of reporting verbs in a particular context is a difficult problem. Jaroongkhongdach (2015) indicates that using reporting verbs in academic discourse seems to be a huge problem for both undergraduate and graduate students. Bloch (2010) and Pecorari (2008) also observe that students have some sort of difficulty to decide or determine what reporting verbs are appropriate in certain circumstances, which almost always lead to distortion of meanings in their assignments. This situation calls for a careful and detailed study on the use of reporting verbs.

Scholars have explored reporting verb usage in academic discourse from different angles (Manan and Noor, 2013; Wu, 2017; Agbaglo, 2017; Jafarigohar and Mohammadkhani (2015); Jaroongkhongdach, 2015; Yeganeh and Boghayeri, 2015). Manan and Noor (2014) examined how students from Malaysia employed reporting verbs in their master's research reports using Hyland's (2002) framework. The study sampled six (6) theses written by Malaysian students in the English Language studies department in a Malaysian university. They found that research acts were the highest with 44.8% of usage, Cognition acts reporting verbs recorded 30.2% of usage, and Discourse acts reporting verbs recorded 25.0%. The Research Acts verb *found* occurred most, *suggest* also recorded the highest frequency as far as Cognition Acts is concerned,

and *state* recorded the highest with regards to verbs in the Discourse Acts. It was concluded that Malaysian students are more accustomed to reporting verbs from the Research Acts group than other types.

Loan and Pramoolsook (2015) also examined how reporting verbs were used in the paper analysis parts of research reports produced by Vietnamese students. Hyland's (2002) approach of identifying reporting verbs was utilized to examine the paper analysis part of twenty-four (24) research reports. The findings revealed that Vietnamese students utilized reporting verbs at random, without regard for their respective roles. The researchers proposed that students be given seminars to help them employ reporting verbs effectively in writing their Master's theses.

The usage of reporting verbs in different cultures was also investigated by Jafarigohar and Mohammadkhani (2015). The research looked at how nativist and non-nativist English speakers employed reporting verbs. The corpus for the study constituted sixtythree (63) articles by English language native and non-native writers. Thompson and

Ye's (1991) reporting verb categorization system served as the theoretical framework. The theoretical approach was built upon Thompson and Ye's (1991) taxonomy of reporting verbs. Textual verbs, mental verbs, and research verbs are the three types of reporting verbs recommended by Thompson and Ye (1991). In comparison to nonnative writers, native writers employed a lot more direct quotations, according to the study. A collection of sixty (60) academic papers from the context of foreign language learning was used by Yeganeh and Boghayeri (2015) in a similar research. Thirty (30) are written by natural English speakers, and thirty (30) are authored by Persian speakers. The study looked at how Persian and English speakers used reporting verbs in the introductory and article overview portions of research papers. The theoretical underpinning for their

research was Francis, Hunston and Mannings's (1996) taxonomy of reporting verbs. Both Persian and English language users preferred the usage of Argue class of reporting verbs, according to the data. The results also indicated that English writers typically used *think* verbs as their second most used verbs while native Persian writers used *find* verbs as their second most used verbs.

Few studies have been conducted across disciplines. Zhang (2008) also conducted research on citation reporting verbs in eight academic fields (social sciences; psychology, economics, history; and Physical sciences: biology, physics, electronic engineering and chemistry). De Oliveira and Pogona (2000) conducted a research on this topic in Portuguese magazines. It was shown that compared to research articles, science articles were more likely to contain Discourse Act verbs or have verbs that connote direct discourse.

Most research papers on the usage of reporting verbs in academia have been undertaken recently, however the majority of these studies took place outside of the African continent. The study by Agbaglo (2017) on reporting verbs in research publications published by professors at the University of Cape Coast is one of the few in sub-Saharan Africa. Very few of works on reporting verbs have focused on reporting verbs across disciplines in the world. The few conducted across discipline were conducted outside sub-Saharan Africa. This demonstrates unequivocally that little research has been done in this field. To close this gap, postgraduate students in the departments of English, Mathematics and Agriculture at KNUST will be observed to see how they employ reporting verbs in their literature analysis chapters.

1.2 Statement of the problem

Many scholars have analyzed academic theses from different angles. Vassileva (2001) and Ngula (2009), for instance, have analyzed academic discourse using modalities.

Majeed (2017) also analyzed academic discourse focusing on tense and aspect. Afful (2016) also worked on academic discourse with dialogue positioning. Different scholars have also analyzed academic discourse from different perspectives. One dominant aspect that has been used to analyze academic text is how scholars use reporting verbs in the discourse of academia. This topic is very important as it helps researchers to know the right kind of reporting verbs to select at what time when writing their research reports. This topic has been studied from different perspectives like the cross-cultural and cross-disciplinary dimensions.

The usage of verbs of reporting in the discourse of academia has been explored from different empirical and theoretical perspectives. Mention could be made of the works of Yegenah and Boghayeri (2014), Jafarigohar and Mohammadkhani (2015), Agbaglo (2017), Manan and Noor (2014) and Loan and Pramoolsook (2015), that have all concentrated on reporting verb usage in academia. Yegenah and Boghayeri (2014) and Jofarigohar and Mohammadkhani (2015) have worked on reporting verbs across cultures that is cross-cultural studies of reporting verbs in discourse. Ramoroka (2014) also conducted a cross-disciplinary studies that is the use of reporting verbs across two disciplines (Departments of Media Studies and Primary Education) in articles written by foreign undergraduates in the University of Botswana. The research targeted how the reporting verbs were used to cite other writer's writings.

Investigations on the usage of reporting verbs across disciplines are uncommon, despite the large number of researches that have been conducted on their use in academic

writings. Ramoroka (2014) is one of the few works in that field. That study focused on undergraduates from two disciplines (media studies and primary education) and not post-graduates (in our case Master of Philosophy students). It cannot be said that there is lack of account of reporting verb usage in theses, but the use of reporting verbs varies according to discipline as well as rhetorical portion Hyland (2000). Essentially, the use of reporting verbs will differ from one discipline to the next. Ramoroka (2014) attests to that fact.

In the Ghanaian context, however, the subject of the use of reporting verb is yet to receive enough attention. Only few scholars like Agbaglo (2017) and Nkansah (2013) have looked at the usage of verbs of reporting in various fields in discourse in Ghana. Agbaglo's (2017) work, for instance, focuses on the use reporting verbs in research articles published by lecturers at the University of Cape Coast (UCC). So far, the subject of the use of reporting verbs in post-graduate thesis works has not received much scholarly attention in Ghana, hence, the need for the present work which seeks to close the research gap, by investigating the use of reporting verbs by postgraduate students in three fields of study at KNUST: English, Agriculture, and Mathematics.

1.3 Significance of the study

Like all other academic research, the current research contributes to the body of knowledge already present in the discourse of academia in general and citation and reporting verbs in particular. On the African continent, primarily Ghana, where research of this kind has received less attention, the current study will be very helpful.

Also, understanding the usage of reporting verbs in written discourse, especially M. Phil theses or dissertations will be useful to students in their selection of reporting verbs in research works. It can also be useful in studying reporting verbs in other genres such

as dissertations and undergraduates’ theses. In order to teach students about research methods, lecturers will use this study as a resource. Finally, the study will act as a springboard for additional investigation into problems relating to reporting verb usage in academic writing in Ghana and other areas in the world.

1.4 Objectives of the Study

The research generally seeks to identify the usage of reporting verbs in M. Phil theses or dissertations by researchers in the English, Mathematics, and Agriculture departments at KNUST. This current study aims to achieve the following.

1. To identify the reporting verbs used by postgraduates (M. Phil students) in the Kwame Nkrumah University of Science and Technology.
2. To identify the frequencies of occurrences of reporting verbs by postgraduates (M. Phil students) in the Kwame Nkrumah University of Science and Technology.
3. To identify the functions of these reporting verbs.

1.5 Research Questions

1. Which reporting verbs are used in research works by Postgraduates in the Departments of English, Mathematics and Agriculture in the Kwame Nkrumah University of Science and Technology?
2. What is the frequency distribution of the various types of reporting verbs used in the research works of postgraduates in the Departments of English, Mathematics and Agriculture in Kwame Nkrumah University of Science and Technology?
3. What are the functions of the reporting verbs in the research reports of postgraduate students of the Kwame Nkrumah University of Science and

Technology?

1.6 Scope of the Research

The current study consists of two major parts. The first part focuses on the quantitative analysis to find patterns and distinctions in how reporting verbs are used across the three disciplines and within each subject. The second part deals with the content analysis to determine the roles played by the various reporting verbs employed by the three disciplines. Additionally, to uncover characteristics specific to academic writings, the current study included studies on modern academic writing literature.

It is evident that the way reporting verbs are used in various disciplines differs significantly (Hyland, 2009). Hyland (2009) demonstrates that there is a disciplinary variation across hard and soft disciplines. The rhetorical structure of works in the Humanities, Mathematics and Agriculture fields are quite similar (Holmes, 1997). Departments of English, Mathematics, and Agriculture were selected for the present investigation in order to better understand the manner reporting verbs are employed in academic writing. This is to determine whether there are distinctions and affinities between the fields of study in relation to the use of reporting verbs.

The usage of reporting verbs in academic discourse has been the subject of some earlier publications, such as Agbaglo (2017) and Manan and Noor (2013). In the Ghanaian literature, very limited studies on this topic have been conducted. This study, which was conducted at KNUST in Ghana, looks at the usage of reporting verbs in the literature review chapters of master's dissertations against this background.

1.7 The Study's Justification

According to Reeves (2009) and Majeed (2017), one of the finest ways for authors to convey their thoughts is to choose the right reporting verb, along with its tense and voice, in a specific situation. This is so because knowledge on the right reporting verb to use will help present work in a logical and coherent manner to avoid being charged with plagiarism. KNUST has a template for how an M. Phil thesis is expected to look like. This means that there is a specific rhetoric structure for M. Phil theses. Despite being stable, its rhetorical framework might change depending on the field of study. The KNUST's manual and instructions for writing theses contain almost no guidance on how reporting verbs should be used in the rhetorical parts of theses gathered from the English, Mathematics, and Agriculture fields of study. What should thesis authors use as a foundation for their choice of reporting verbs if they are unable to provide examples of how students can use them in their writing? Also, what standards and principles should research supervisors use as a basis for their decisions about the use of reporting verbs in theses? This research examines the kinds of reporting verbs employed in the departments of Mathematics, English, and Agriculture in order to answer these questions. The study will also look at how reporting verbs are utilized in the three fields' dissertations.

1.8 Organization of the Study

Five chapters make up the thesis. The first chapter is devoted to the introduction, which includes the study's history, problem statement, purpose, research questions, significance, scope, and organizational structure. Chapter Two reviews literature on the subject and offers the study's theoretical, conceptual model and empirical support. The literature review in Chapter Two analyzed several research works on reporting verbs in academic discourse. The chapter discusses the findings of other works. The chapter again discusses the study's theoretical underpinnings for reporting verbs. The chapter two

again explained some terminologies that guided the study. The study's techniques and processes adopted to carry out the research are described in chapter three of the thesis. The findings and discussions are explained in the fourth chapter. The outcomes, implications, and recommendations of the study are addressed in chapter five, along with recommendations and ideas for additional study.

1.9 Chapter Summary

Few studies on reporting verb usage in academic research works have been conducted, as this chapter has explained. This has made it necessary to perform the current study, and its goal is to conduct a quantitative examination of how reporting verbs are used in M. Phil. theses at KNUST. The section has again looked at the context of the study, the problem statement, the research purpose, the research questions, the significance of the study, its scope, its rationale, and its organization. Additionally, it has been suggested in this chapter that KNUST's theses supervisory lectures and guidelines are insufficient for instructing students on the selection of reporting verbs for their theses.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter is dedicated to the analysis of the previous research works that are pertinent to the present work. The chapter begins with an outline of the fundamental ideas that guide the investigation and the theoretical framework. We then proceed to discuss a few empirical studies organized along geographical and topical lines. The chapter is organized as follow: Section 2.1 examines some key concepts. Literature on empirical review is presented in section 2.2. The theoretical framework is presented in section 2.3.

The conceptual framework is presented in section 2.4. Section 2.5 summarizes the entire chapter two.

2.1 Definition of Key Concepts

Citation, Reporting Verbs, Thesis Writing, Literature Review and Academic Disciplines were the main terminologies that the study was based on. To give readers a clear and thorough overview of the explanation of concepts and to demonstrate how these concepts are applied in the current study, these concepts are explained in a stagesetting mood.

2.1.1 The Concept of Citation

In academic writing, citation basically helps to find the root of a piece of research in existing literature. Given that plagiarism is a crime in academic discourse, it is important that writers make conscious effort to cite other people's works appropriately. Citation serves as a foundation on which scholars build their work and serves as a rhetorical device that plays a vital role.

Ziman (1968) asserts that a scientific work is ingrained in the field's body of literature and cannot be read in isolation. He further explains that citation refers to the reference to a published source or an unpublished one. This basically means referring to or alluding to an already existing work which is related to your study. It typically deals with in-texts and references. Narin (1976) also asserts that reference is the acknowledgement that one document gives to another; a citation on the other hand is the acknowledgement that one document receives from another. This means that citation provides information to new researchers on their chosen topics. Swales (2014) explains that citation suggests a connection between a portion and the entirety of the referring source. Citation allows scholars to construct their own authenticity about their topic.

Nanyue (2013) argues that the term “citation” and “reporting” are not interchangeable. They only perform the same job as citing earlier studies. According to Nanyue (2013), citation concentrates on the explicit form in which the author’s last name and year of publication appear. Most citations use reporting verbs. Jalilifar (2012) asserts that quoting other research papers is a distinctive aspect of scholarly writing. This strategy serves a complicated communication goal and comes in a variety of forms. Learning how to properly incorporate other scholar’s statements and thoughts into their research work and effectively communicate their research are two qualities that writers can develop (White, 2003).

Hyland (1999) believes that knowledge is constructed through referring to the works or ideas of other scholars. This is because it helps new researchers to identify where gaps exist in literature and what needs to be done. From an applied linguistics perspective, Swales (1986), one of the pioneers of the study of citation analysis distinguishes between citations that carry the author’s name inside the sentence and those that carry the author’s name outside the sentence. The first one is known as *integral* citations whereas the second one is also known as *non-integral* citation. Swales (1986) explains that in integral citation, the name of the cited writer becomes a syntactic component of the citing text. This means that it is typically based on the scholar than the study. In non-integral citation also, the writer’s name is shown in the end of the text Swales (1986). Reporting verbs are typically used in the integral ones. This is because, that is where writers make reference to the original authors directly. Reporting verbs are what this study seek to study.

2.1.2 Reporting verbs

Thomas and Hawes (1994: 129) define reporting as “the attribution of propositional content to a source outside the author of the article in the current situation, and the marking of this by the presence of any of a number of signals of attribution.” Reporting verbs are employed in doing this. If the correct type of reporting verb is not selected to report appropriately, it may change meaning and the researcher may be charged with plagiarism. Swales (1990) believes that reporting is only signaled by the use of reporting verbs. This means that to be able to identify that there is reporting in a text, there should be the presence of reporting verbs. Thomas and Hawes (1994) hold a different view, in that, they believe reporting is communicated not just by reporting verbs but also by reporting nouns, reporting adjectives, and reporting adjunct. Examples of reporting nouns include *prior research* and *scholars in the field*. Examples of reporting adjectives are *so-called* and *concerned*. Examples of reporting adjuncts are *according to* and *in the words of*. This research focuses on Swales (1990) and does not focus on reporting in the general sense. The usage of reporting verbs in academic writing, specifically with regard to thesis (dissertation) writing, is the subject of the current study. According to Un-udom and Un-udom (2020), reporting verbs are among the most crucial components of scholarly research papers since they are utilized to convey the method and veracity of assertions made to support the author’s work. Charles (2006) indicates that the reporting verb basically serves two functions. First, it is typically employed “to give credit to other researchers and to use their work in the cumulative construction of knowledge” (Charles, 2006; 326). Secondly, it is an essential component of language that conveys an author’s perspective on the research papers of different scholars in a particular field (Hyland, 1999; Thompson and Ye, 1991).

Scholars like Bruce (1989), Granger (1993), Thompson and Ye (1991) belong to the school of thought who believes that the use of reporting verbs in academia presents

several challenges for non-native authors. This means that reporting verbs are very important and are not typically known by non-native scholars. Hyland (2009) indicates that in an academic paper, reporting verbs are linguistic tools that writers utilize to convey their own viewpoint. This view is not different from that of Bloch (2010). Bloch (2010) explains that using reporting verbs allows authors to express their opinions about other people's claims as well as their own views. Jaroongkhongdach (2015) indicates that a reporting verb is a vital element in writing a research paper in English. Reporting verbs are defined as "one of the most important issues in writing academic paper because they are used to express the process and reliability of claims to support author's writing (Un-udom and Un-udom 2020: 162)".

Scholars believe that most researchers, typically non- native speakers of English, have little or no knowledge about reporting verb usage in academic writing (Thompson and Ye, 1991; Hyland 2002). Myers (1996) also asserts that this problem is worsened by the lack of teacher's attention to reporting verbs during research method lesson. This means that teachers and lecturers do not make conscious efforts to teach novice scholars how to write academically with reporting verbs. This is again stated below;

"insufficient knowledge of verbs that are typically used in academic written discourse is a serious handicap for learners as it prevents them from expressing their thoughts in all their nuances and couching them in the expected style" (Granger and Paquot, 2009; 194).

Given this *status quo*, there should be conscious efforts to teach learners the best way to employ reporting verbs in written scholarly discourse to help them convey their thoughts appropriately and in a harmonious manner. The above explanations indicate that

reporting verbs are very important in academic discourse and so it is appropriate if this study focuses on it.

2.1.3 Thesis Writing

The word “thesis” originates from Latin and means “to debate or discuss” (Afful, 2016). In its literal definition, the term “thesis” can refer to a proposition that is put forward for discussion and proof, or a belief system that is upheld or advanced in a debate (Afful, 2016). In the United States of America, the term “thesis” is sometimes known as “dissertation.” Thesis writing is still a highly important genre in graduate research education, and it demonstrates severe academic illiteracy in a number of universities throughout the world. The thesis, according to Hyland (2001), is the most essential piece of writing that students do during their postgraduate programmes. The thesis is written not just by postgraduates, but also by undergraduates. Simply put, Ghanaians call a postgraduate thesis a thesis and an undergraduate thesis a dissertation.

The phrases “dissertation” and “thesis” are not always used in the same sense (Corne and Foster, 2006). In the United Kingdom, the phrase “thesis” refers to academic research papers published by masters and PhD candidates, whereas the term “dissertation” means an academic research report written by undergraduates. Ghanaians use these terms in the manner that they are used in the United Kingdom. Australia and other European countries, on the other hand, are in the opposite situation. The thesis is thought of as an academic paper which is usually convincing. It comprises evidence of a person’s familiarity with the research discipline in addition to extensive knowledge of the chosen academic sector. That a project work is a thesis or dissertation is determined by the length of the programme and the stage of the programme (Afful, 2016).

The distinction between thesis and dissertation, according to Corne and Foster (2006), is not apparent. In the United States, for example, a thesis is usually linked with a master's degree, whereas a dissertation is usually associated with a doctorate (Afful, 2016). Despite this, some colleges continue to use the term synonymously. The phrase "dissertation" is linked with master's degrees for workers and experts who are not in academia in most Ghanaian universities, the phrase "thesis" on the other hand is linked with degrees designed specifically for those in academia and examples are M. Phil and PhD degrees (Akoto, 2011). The phrase "thesis" is typically adopted in this work to mean a project work that is presented as part of the Master of Philosophy (M. Phil) degree requirements. According to Akoto (2011), theses are classified according to the student's level of higher education. He distinguishes between undergraduate, master's and doctoral thesis. "The master's research report refers to the position between a firstdegree holder and a doctorate degree candidate, that is, shifting from studentship to the title of an expert (p.xiv)," this is according to Akoto (2011). There are several parallels and distinction between the two categories of postgraduate theses. Both are intellectual genres authored by postgraduate students and researchers, which explains the similarities. Another similarity is that they are all concerned with the addition of knowledge in the sphere of academia at higher education institutions. They are both scholarly works that are carried out in part to fulfill the requirements for Master of Philosophy degrees. However, there are some distinctions between these two genres. They are distinct in that their authors are members of academic discourse groups, and their "power asymmetries" with disciplinary censors are distinct (Koutsantoni, 2007:57).

It is important to recognize that a postgraduate thesis is more than just "a summary of results from a project work; it also includes in-depth specialized expertise together with customs, traditions, work standards gained after a period of socialization in a field (Afful,

2012: 135).” According to Afful (2012), the objective of a postgraduate thesis is to provide answers to questions, confirm hypotheses, and increase comprehension of a specific area. A number of studies on postgraduate thesis have been conducted. Majeed (2017) for example has studied tense usage in M. Phil thesis. Afful (2016) has worked on the use of dialogue in M. Phil thesis, as well as Afful and Akoto (2010) on thesis titles. As earlier indicated, one area that has not received much attention with respect to thesis genre is how reporting verbs are employed in writing. The present study, therefore, compares and contrasts to identify how three disciplines use reporting verbs.

2.1.4 Literature Review

The explanation of literature review will typically be based on Bitchener (2010), Snyder (2019) and Baumeister and Leary (1997). These scholars have explained the concept of literature review from different angles. Baumeister and Leary (1997) describe Literature Review as a comprehensive way of compiling and summarizing prior research. Webster and Waston (2002) also indicate that a thorough literature evaluation gives a solid basis for new discoveries and the support for theory creation. Bitchener (2010:59) argues that “having introduced your reader to the issue, problem or question in the introduction chapter, the objective of the literature review is to present a comprehensive account of the relevant knowledge pertinent to the setting in which your investigation is located and, doing so, to present a “case,” “position,” or rationale for the research.” This basically means that the literature review provides background for a study to be conducted.

Bitchener (2010) identifies seven key functions of the literature review section. This is shown in figure 1 below

Functions of a thesis literature review

1. A review of the non-research literature that summarizes and synthesizes background and contextual information.
2. A review of theoretical perspectives that underpin or inform your research project.

3. A review of the research literature relevant to your study.
4. A critique that
 - Identifies arguments for and against issues and controversies related to functions 1-3 above
 - Assesses or weighs up the value of theories, ideas, claims, research designs, methods and conclusions, including an identification of strengths and weaknesses.
5. An identification of gaps or shortcomings in this knowledge and research.
6. A rationale justifying why gap was important and significant enough to be filled.
7. An explanation of how the design and execution of your research project was informed by steps 1-6 above. This is likely to explain how the literature provided
 - A focus for the research questions or hypotheses that were investigated and
 - Guidelines for an appropriate methodology and design.

Figure 1: The Literature Review Chapter's Purpose (Bitchner, 2010:59)

Figure 1 above makes it clear what a literature review is expected to do. The literature review establishes the historical context of a topic. It helps the researcher to identify what has been done and what needs to be done. In other words, it aids in the identification of the gap that must be filled. It is also recognized that research reports provide a comprehensive, accurate, and thoughtful summary of the materials relevant to a specific investigation, provide the audience with a hypothesis relevant to the investigation, and present a thorough check and verification of original information. The literature review again helps the researcher to identify the theoretical framework that can underpin the research. It again helps to identify how the data will be analyzed. Cooper (1998) proposes two key components that characterize literature reviews in higher education theses. The initial one is that literature review sections rely on information from its database of primary or original scholarship rather than reporting new primary scholarship. The literature review, on the other hand, describes, summarizes, assesses, clarifies, and/or combines the source reports' content.

This view of literature review is linked to that of Hartley (2008). Hartley (2008:87) indicates that "Literature Reviews combine and analyze information from several fields, assess the strength of the information for a given point, bring out gaps in the previous

research, and indicate areas that require additional study.” This basically means that literature review helps the researcher to identify the lacuna and where research needs to be conducted. Snyder’s (2019) view about literature review is not different from Hartley’s (2008) view about literature review as the former explains literature review as a great method of synthesizing research results to identify proof on a discourse and to highlight problems in want of empirical investigation, and that is an important step in developing analytical approaches and methodological approaches.

This also simply means that the literature review helps to identify the lacuna or the gap that needs to be investigated.

According to Bruce (1994), the review of literature has six components and they are: a highlight, a search, a survey, an instrument for studying, a data analysis coordinator, and a presentation. Literature review, according to Bruce (1994), is both a procedure and an outcome. Bruce (1994) views literature review as both a procedure and an outcome; stating that it entails the investigator to analyze the information in order to construct current system, identify the issue or study inquiry, for the necessity of continuing the existing line of study, and to measure the results and concepts to his or her viewpoint. It is viewed as an outcome because it deals with the analysis of the research of other authors in a way that shows the successful completion of the explanatory procedure.

Britchner (2010) indicates the content and structure of a thesis literature analysis. He indicates that the content has a series of themes and topics which are typically signaled by the use of heading and sub-headings. He again indicates that the analysis goes beyond simple descriptions but it contains a criticism of the materials. Britchner (2010) again indicates that after the review, the researcher will identify gaps in literature and what needs to be done. The figure below summarizes the organization option for a literature review.

Approaches for structuring a literature review

1. The themes and topics of the review
2. The research questions or hypotheses bring addresses
3. The variables investigated in the study
4. A chronological presentation of non-research and research literature
5. A combination of these option

Figure 2: Approaches for structuring a literature review (Bitchner, 2010:61)

In doing literature review, the steps outlined in figure 2 above is adopted. Scholars indicate distinct types of literature review genres. As far as positioning and placement is concerned, scholars distinguish thesis that could take up a named section or the ones that may be included in other sections in a research report article, often in the introduction (Swales and Lindemann, 2002). The literature review, according to Bruce (1994), is a regular rhetoric part of a thesis or research paper. The literature analysis is a vital section where researchers read around the topic under research and prove to the readers that they have mastery of the topic.

A research work cannot be conducted in a vacuum so researchers try to link their works with existing literature. The researchers give evidence to their works and build up upon previous works that exist in literature. Paltridge and Starfield (2017) indicate theses and dissertations provide an opportunity where researchers show the link between their new ideas and that of their forerunners. Every research must have credibility and justifications and this is gained through a strong literature review.

Reporting verbs are used extensively in the literature analysis section. Soler-Montreal and Gil-Salom (2011) indicate that citations are often seen in the literature analysis sections. They are found there because it is the section that alludes to previous works. Engaging previous works is more or less reporting. That is reporting what exists already.

In doing that, reporting verbs are used. The focus of this research is to identify reporting verbs employed in academic discourse. The literature review part of a research work is paramount to this present study because it is the section where there is a dominant use of reporting verbs.

2.1.5 Academic Disciplines

Discipulus, which implies student, and *disciplina*, which also means instruction, are the Latin terms that give rise to the phrase discipline (noun). Another term that is connected to this is „*disciple*,“ as in Jesus Christ’s disciple. When used as a verb, discipline involves teaching a person to obey a strict established rule or penalizing and ensuring submission. In other words, it entails enforcing specific attitudes or actions (Krishman, 2009). Traditionally, the word “discipline” was connected with par militaristic and hegemonic analogies, leading to terminologies like “territory,” “edges,” “barriers,” “regions,” “empires,” “fiefdoms,” “divisions,” “unit,” and “imperial architecture,” among others (Foulcaut, 1979). A discipline, according to Hyland (2004), is a field of study that shares a communication system, a history, established customs, principles, and ethics. Hyland (2003:3) claims that “although writing is a defining characteristic of disciplines, the fundamental distinction between disciplines is not found in the content of the writing but rather in the manner in which it is produced.” North (2005) also claims that, unlike studies in the Humanities, studies in the scientific fields often contain a common worldview in which investigation advances by elaborating on what has already been done. Afful (2016) does not agree with this assertion, stating that the bulk of humanities research not only add to existing knowledge, but also reveal new and exciting results that lead and shape national policies.

Adiko (2009) gives an example of a common academic discipline description. A discipline, according to her, is a distinct area of research with a fundamental collection of information and established procedures within the subject. A discipline seems to have an administrative framework, a worldwide society, specialized institutions, and subjects in its institutional representations (Adiko, 2009). The current study is related to academic discipline in the sense that it intends to discover the employment of reporting verbs in M. Phil theses from three disciplines: English, Mathematics, and Agriculture, which represent Humanities, Physical Sciences, and Natural Sciences, respectively. These three chosen disciplines have their own set of norms, traditions, beliefs, principles, and practices that govern how research should be undertaken in these subjects.

Biglan (1973) also created a classification system for disciplines based on their member's ideas about them, which aims to explain some of the differences between disciplines. This classification system by Biglan (1973) divides discipline into hard and soft disciplines. He calls the soft discipline paradigmatic discipline and the hard discipline as termed by him as pre-paradigmatic discipline. The natural sciences and physical sciences are what are referred to as hard disciplines while the humanities and social sciences are referred to as soft disciplines. Biglan (1973) again provides a distinction between "pure" or largely hypothetical disciplines (such as physics) and "applied" disciplines (such as technological sciences), as well as between disciplines that deal with "biological systems" (such as anatomy) and those that deal with "nonbiological systems" (such as political science). The hard discipline in general terms according to Biglan (1973) would have better levels of social connectivity in their specialized fields, and are much more bent on publishing research papers. The soft-like discipline on the

other hand according to Biglan (1973) would receive less regard, this is because their people will be much less linked and more devoted to tutoring and producing publications.

This paragraph discusses the disciplinary variations in the usage of reporting verbs.

Hyland (2009) distinguishes between hard and soft disciplines. According to Hyland (2009), the soft discipline includes philosophy, sociology, applied linguistics marketing etc. The hard discipline on the other hand according to Hyland (2009) includes courses like Biology, Electrical engineering, Mechanical engineering physics, etc. In summary, it can be said that the soft discipline include discipline in the social sciences and languages. The hard discipline on the other hand comprises the physical, biological and mathematics courses. Hyland (2009) indicates that different fields use reporting verbs in different ways. Evidence from Hyland (2009) suggests that writers in different fields show different attitudes towards their literature. Hyland (2009) indicates that researchers in the soft discipline have a specific kind of reporting verbs they employ while those in the hard discipline also have another kind of reporting verb they also employ. Hyland (2009) indicates that soft disciplines largely use reporting verbs like *discuss*, *argue*, and *suggest*, while hard discipline also use reporting verbs like *show*, *find*, and *report*.

Hyland (2000) also worked on reporting verbs across the soft-skilled and hard-skilled disciplines and also concluded that authors in the soft-skilled disciplines employ a wider variety of reporting verbs than authors in the hard-skilled disciplines. This according to Hyland (2000) is that authors in soft disciplines must cite other academics whose research works are well-known and esteemed in order to corroborate their claims. Writers in the hard-skilled fields on the other hand do not use many reporting verbs because there is no need to cite the opinions of others as fact is readily determined from sightings and numerical information. The difference in the use of reporting verbs does

not mean that some reporting verbs cannot be found within both disciplines. Authors in soft discipline use more „discourse act“ while authors in hard disciplines tend to utilize „research act“ reporting verbs (Hyland, 2000). There is the need to establish these differences as this study focuses on the two disciplines which are hard and soft disciplines. English language falls under the soft discipline, Mathematics falls under the hard-non life discipline, and Agriculture falls under hardlife discipline. These three were selected because the researcher wanted to study the reporting verb usage across three disciplines and there was the need to represent three disciplines fairly. The researcher is affiliated to the English department and so selected that. The researcher again needed a field in the hard-non life discipline and selected Mathematics department, the researcher again selected the Agriculture discipline to represent the hard-life discipline. These disciplines have also not featured in any research of this kind. The findings of this current study will either confirm these results of Hyland (2000; 2009) or not.

2.2 Empirical Review

Many researchers have concentrated on how reporting verbs are employed in academia. Most of the scholars on this topic draw conclusions on it. This research paid attention to related reporting verb studies that have been carried out. For the purpose of this research, an evaluation and synthesis of these researchers“ research papers was conducted. The goal and purpose of the research works, methods adopted to conduct the research works, the results, inferences and suggestions of the related studies under examination were among the topics that were highlighted in their studies.

2.2.1 Studies on the usage of reporting verbs outside Africa

Neff, Dafouz, Herrera, Matinez, Rica, Diez, & Sancho (2003) investigated the communication of the author's viewpoint through the employment of epistemic and reporting verbs. The data for the study constituted articles written by student authors from a variety of local language backgrounds, including native and non-native speakers of English. These students were Native American speakers of English and five English as Foreign Language speakers. These speakers were Spanish, Dutch, Italian, French, and German speakers. The study compared the manner in which these writers constructed stance by studying how they employ evidence-gathering techniques. The texts by American university students were compared and critically evaluated with texts authored by speakers of Spanish, Dutch, Italian, French, and German who are all foreign speakers of English. The findings indicated that the English as Foreign Language authors either over utilize or underutilize modal verbs as compared with the American authors. This shows that there is a distinction in the way the two cohort of writers use modal verbs. The reason for the difference may be as a result of the difference in linguistic backgrounds. Since the EFL students do not have command over the use of English language, they may have limited knowledge on the modal auxiliary verbs.

The results also indicated that with regards to the usage of reporting verbs, native speakers of English utilize a variety of reporting verbs, many of which carry a pragmatic import of stance taking. The reason for this difference may also be because of the fact that EFL writers have very limited knowledge about reporting verbs and for that matter are not exposed to many reporting verbs. They tend to use only the few they are aware of. A review of this topic indicates that the focus of the writer was not typically on reporting verbs in discourse but how writers used reporting to construct stance hence the need for this current study to work solely on this current research. It was obvious in this study that non-native speakers do not use a lot of reporting verb.

Ghanaians are non-native speakers and so we shall see from this current study whether there are limited reporting verbs in the data to confirm this assertion.

Hyland (2009) also examined citing and appraisal in English book review essays. The data for the study constituted a corpus of sixty (60) English book review essays which consisted of 359,000 words, a corpus of forty-five (45) history review articles published in five British and American academic journals which also consisted of 206,089 words and the last cohort which was made up of a corpus of twenty-four (24) economics book review articles published in six British and American academic journals which also constituted 167,239 words. The research adopted Biber et al. (1999), Hyland (2001, 2002a) as the theoretical framework. The study design employed for the research work was both the mixed approach, which are both quantitative and qualitative research designs. Hyland's (2002) model was used to examine the data. The results indicated that out of the discourse act verbs, reporting verbs like *argue*, *suggest*, *describe*, *point out*, *conclude*, *say*, *claim*, *discuss*, and *propose* were present in the data. The results also indicate 81.3 percent of reporting verbs in history were from the discourse act verbs. *Believe*, *think* and *assume* are some examples of cognitive act verbs that featured in both economics and history disciplines. The discourse act verb *argue* is the often used reporting verb in the three fields of study. The history discipline also recorded the highest reporting verb. The study shows that data was collected from experts in academia hence the need for this current study which focuses on writers who are in between experts and novice writers who are M.Phil. Students. The current study adopted the research design of this study which is the mixed method.

Manan and Noor (2014) also conducted a research in Malaysia. Manan and Noor adopted Hyland's (2000) categorization of reporting verbs as the theoretical underpinning. The

researchers adopted a mixed method research design for the study. The data for the study constituted Masters Theses by English Language Studies which were completed in 2012 in University Kebangsaan Malaysia (UKM). In all, six theses were selected for the study. Three theses each from two semesters, the theses were randomly selected and the researchers photocopied the literature review sections. The researchers used a checklist to aid their data analysis. From the six theses studied, the results indicated that the reporting verbs from the research act group recorded the largest proportion which was 44.8%. Reporting verbs from the cognition acts group recorded 30.2%. Discourse act reporting verbs recorded the lowest proportion with 25.0% of the total reporting verbs used in the literature review section of the theses.

The high percentage for research acts category indicates that M. Phil graduates from the UKM department of English Language Studies employed reporting verbs from the research act group mostly in comparison with cognition acts and discourse acts verbs. This indicates that these students are more familiar with verbs from the research category. This also means that the students did not think critically in synthesizing the literature that was reviewed. This means that the students are not familiar with the highlevel reporting verbs as they require students to think. Students are only familiar with low level reporting verbs. Students can be seen to have low level of knowledge about cognition act verbs in comparison with research act verbs and discourse act verbs. The findings from the research indicate that *found* from the research act group is the most generally utilized reporting verb and it recorded thirty-four (34) occurrences. *States* from the research act fraternity also recorded the highest appearance with thirty-six (36) occurrences. The cognition act category also had *suggest* as its highest reporting verb with twenty (20) occurrences. A review of this study indicates that the data sets are not enough to make a generalization of an entire university. Just six (6) theses are not enough

to make generalizations, the researcher should have increased the data set. The researcher did not explain why he selected UKM, there are several universities in Malaysia so why did the researcher select UKM? Again, there are many departments in UKM, so what accounted for the selection of department of English Language Studies. This current study is unique because it justifies why the KNUST was selected. The data is also expanded to about 40 research theses from three disciplines.

Jafarigozar and Mohammadkhani (2015) also researched on the usage of reporting verbs in English language research papers by native and non-native authors of English. This research investigated the distinction in the usage of reporting verbs the English language research articles written by non-native speakers of English and native speakers of English. Jafarigozar and Mohammadkhani (2015) unlike Manan and Noor (2014) used Thompson and Ye's (1991) categorization of reporting verbs as their theoretical framework. The mixed method study design was adopted for the study. The data for the study constituted sixty-three research papers from publications from the area of language teaching and applied linguistics. The journals are "Modern Language Journal", "Regional Language Center Journal", and "System". Thirty-three (33) out of the (63) sixty-three articles were written by non-native speakers of English and the remaining thirty (30) were written by native speakers of English language. The findings show that there is no significant difference between the use of reporting verbs between native speakers of English and non-native speakers of English. The results indicate that native speakers of English used one hundred and eighty-three (183) reporting verbs in their articles while non-native speakers of English also used one hundred and eightyfive (185) reporting verbs in their research articles. The entire list of recognized reporting verbs in the corpus constituted two hundred and fifty-four (254) reporting verbs in five subcategories. The number of reporting verbs in the author's act category outnumbered

that of the writer's act categories. The textual or discourse act verbs recorded the highest number and these verbs belonged to only non-native English speakers. The mental acts verbs recorded the lowest number of reporting verbs. The results indicated that both native and non-native authors employed the same number of reporting verbs in all, and these verbs appeared in the same number of sentences. This researcher should be commended for the data set used. Sixty-three (63) research articles are quite good.

Loan and Pramoolsook (2015) also investigated the use of Reporting Verbs in Literature analysis Sections of TESOL M. Phil dissertations authored by Vietnamese graduate students. The study adopted Hyland's (2002) model of reporting verb classification. The mixed method study design was adopted for this research. The data for this research constituted twenty-four (24) digital TESOL M.A. dissertations. The study was typically for Vietnamese postgraduate students. The corpus for the study constituted 164,344 words. Reporting verbs from the discourse act category recorded the highest number of frequencies which accounted for almost two thirds of the reporting verbs in the literature review chapters of the dissertations. The discourse acts verbs recorded 62.90%, followed by research act verbs which recorded 28.42% and then cognition act verbs were the least with 8.68% of reporting verbs. The findings for the research according to Nguyen and Pramoolsook (2015) confirm trends in the usage of reporting verbs in applied linguistics. In all, the study recorded eight hundred and seventy-six (876) reporting verbs. Five hundred and fifty-one (551) were discourse act verbs, two hundred and forty-nine (249) were also research act verbs and seventy-six (76) were cognition acts. For research act verbs, finding verbs recorded 14.61% and procedure verbs recorded 13.81%. For the finding verbs too, factive verbs recorded 3.54%, counter-factive and non-factive verbs recorded 11.07%. For cognitive act verbs, positive verbs recorded 2.05%, critical recorded nothing, tentative 5.82%, neutral verbs

constituted 0.80%. For, discourse verbs, doubt verbs constituted 9.13%, assurance verb constituted 55.42% and counters also recorded 0.34%. For this study, it was clear that the data set was good enough to make a generalization. The theoretical framework for the research suited the study very well.

Yeganeh and Boghayeri (2014) studied the prevalence and purpose of Reporting Verbs in academic papers authored by native Persian and English users. The study adopted Hyland (1999) and Francis, Hunston and Manning (1996) as the theoretical frameworks. Data was analyzed quantitatively. The corpus for the study constituted sixty (60) research articles. Thirty (30) out of the sixty (60) academic papers were authored by native English speakers and thirty (30) were authored by Iranian researchers in the field of Second Language Acquisition. The study focused on the literature review and introduction sections of research articles. The data that were used were data that spanned from 2000 to 2014. The results for the study indicated that *argue* verb recorded the highest frequency. English native speakers recorded 40.5% and Persian speakers recorded 23.3% of reporting verbs. It was found that Persian speakers had the probability of using *find* verbs as their second preferred reporting verbs. English speakers also showed the tendency of using *think* verbs as their second priority verbs. This means that there is a distinction in the way native speakers of English and Persian speaker use reporting verbs in the literature review and introduction sections of research reports by these two categories. It was concluded that English authors employed many *argue* verbs groups than Persian writers.

Jarkovska and Kucirkova (2020) also embarked on a research on utilizing reporting verbs in M. Phil thesis literature reviews as citation style in research papers in English as a foreign language. The data for the study constituted eighty-two (82) M. Phil theses written in English by Czech students of the English program of Economics and

Management in a university in the Czech Republic. The literature review sections were used for the research. The theses were downloaded online and they constituted theses which were defended between January 2017 and June 2019. In all, the corpus constituted 439,356 words. Hyland's (1999; 2002) categorization of reporting verbs was employed as the theoretical underpinning for this research. The findings indicated that all three reporting verbs categories occurred in the data. Discourse Acts verbs recorded the highest frequency with 68.5%, followed by Research Acts verbs with 20.8% and the lowest was 10.7%. In all, the mean occurrence of reporting verbs was 10.21 per 5,358 words.

Within the Discourse Acts verbs, it was the assurance verbs that mostly occurred with 95.3%, the non-factive verbs recorded 56.6%, factive verbs recorded 38.7%. Among Research Acts, procedures verbs were the most frequent with 62.1% occurrence. Finding verbs recorded 37.9%, factive verbs recorded 20.7%, and Non-factive verbs recorded 17.2 occurrences. There was no counter factive research verb used. For the cognitive act verbs, positive cognitive acts verbs recorded 70% occurrences. The discourse acts verbs *state* and *point out* were found in seventy-five (75) and sixty-nine (69) occurrences each respectively. These accounted for 13% and 12%. The verb *claim* was the most frequently used factive assurance verb with 11% appearances. The most widely employed factive assurance verb was *define* and had fifty-seven (57) occurrences with 10%. The lowest frequency verb was *suggest* and it was a tentative verb which is a cognitive act verb. *Add* recorded fifty-one (51) occurrences with 29.3 for all research acts verbs.

Mar (2020) also examined how reporting verbs were employed in research publications. The quantitative research design was adopted for the study. Hyland's (2002) model served as the theoretical framework for the study. The dataset for the research were collected and analyzed using a checklist. The data set for the study constituted ten (10)

university journals published in the year 2019. These articles were articles that were written by twenty-two (22) tutors from the departments of English. The literature review sections were studied to identify the reporting verbs. Discourse act verbs recorded the highest frequency with eighty-three (83) occurrences which represented 72%. Research acts verbs followed next with twenty-six (26) occurrences forming 22%. The last category was the cognitive acts verbs with seven (7) occurrences which represented 6%. For the research act category, finding verbs constituted 2%, non-factive verbs constituted 2% and procedure verbs constituted 21%. For cognitive verbs too, positive verbs constituted 3%, and neutral verbs constituted 3%. For discourse act verbs, doubt verbs constituted 10%, tentative verbs recorded 10%, assurance verbs constituted 62%, factive verbs also 13%, and non-factive verbs 48%.

Un-udom and Un-udom (2020) also did an examination of the use of reporting verbs in applied linguistics using corpora. The research investigated the most popular type of reporting verbs and the manner they are employed in the referencing method in language studies research works. The research adopted Hyland's (2002) model of reporting verb classification as the theoretical framework. Fifty-two (52) research works from three English studies publications constituted the data for the study. The literature review chapters of these articles were examined. The verb forms and voices of the reporting verbs were also investigated. The results for the study indicated that research act verb types recorded the highest frequency. Followed by discourse act verbs. Cognitive act verb type recorded the least frequency. Research act verbs recorded 58.4% of the total reporting verbs identified. Discourse act verbs followed with 35.12% of the reporting verbs. Cognition also had 6.48% of the total reporting verbs identified. For research acts, finding recorded 30.2%, procedure verbs recorded 28.38%, factive recorded 7.43%, non-factive verbs recorded 22.59%. For cognitive act verbs, positive verbs recorded 0.59%,

tentative recorded 4.75%, and neutral verbs recorded 1.14%. For discourse act verb, doubt verb recorded 6.84%, assurance verbs recorded 28.28%, tentative verbs recorded 6.49%, critical verbs recorded 0.35%, factive verbs recorded 15.01%, and non-factive verbs recorded 13.27%. The researchers recommended that additional research can be done with a huge corpus and more reporting verbs can be studied in that regard.

2.2.2 The Use of Reporting Verbs in Academic Discourse in Africa

Research works carried out on reporting verbs in Africa appear to be typically rarer than those done in outside Africa. Two of such studies are worth mentioning.

Agbaglo (2017) worked on the kinds and number of reporting verbs used by lecturers in a Ghanaian university. The research was conducted in the University of Cape Coast in Ghana. Hyland's (2002) categorization of reporting verbs was the conceptual model that underpinned the research. The corpus for the study constituted 16,811 words which were made up of ten (10) research papers published by academics in the department of English in the University of Cape Coast. The mixed method research design was adopted as the research design. The results for the research indicated that all the three categories of reporting verbs appeared in different percentages. The results for the study indicated that there were eighty-four (84) occurrences of research act verbs and this constituted 42%. For cognitive verb, there were thirteen (13) occurrences which represented 6.5%. Discourse act verb constituted one hundred and three (103) reporting verbs which constituted 51.5%. For research act verbs, finding verbs recorded 17%, and factive verbs recorded 4.5%. For cognitive act verbs, positive verbs constituted 2.5%, tentative verbs constituted 3%, and neutral verbs constituted 1%. For discourse act verbs, doubt verbs constituted 2.5%, tentative verbs constituted 2.5%, there was no critical verb used. Assurance verb constituted 49% of the reporting verbs in the research articles, factive

verbs constituted 19%, and non-factive verbs constituted 30% and there were no counter verbs. In all, *discuss* emerged as the reporting verb with highest frequency for discourse act verbs. *Examine* also registered the greatest number of data points for the research act category. With regard to cognitive act verbs, *consider* and *believe* had the highest frequency.

Another study was also conducted in Southern Africa on a content analysis of referencing patterns in research works in two departments at the University of Botswana and examined how they are incorporated into academic writing. This study was conducted by Ramoroka (2014). This study typically focused on the departments of Media Studies and Primary Education. Thomas and Hawes (1994) model of reporting verbs classification served as the framework for data analysis. The research typically concentrated on the types of reporting verbs employed and the manner these reporting verbs were used in reporting the findings of previous researchers. The corpus for the study constituted forty (40) essays by these students, twenty (20) from each department. The study concentrated on *Discourse Act Verbs* or *Textual Verbs*. The results for the study indicated that the students employed many *informing verbs* (verbs pertaining to the objective transfer of messages from the author to the recipient) without the interpretation of the referenced data as opposed to arguing verbs, which denote an evaluating function. The results also reveal that students from the Department of Primary Education recorded many reporting verbs as compared to students from the Department of Media Studies. The study concluded that there was a contribution of research on citation by foreign speakers of English.

A review of both articles shows some short fall, for Agbaglo (2017), the corpus for the study was very small. He could have expanded the data size. Ten (10) research articles are not enough to even represent the department of English let alone represent the entire

University of Cape Coast. For the study by Ramoroka (2014), the corpus was also not enough and that a bigger corpus may have yielded a different result. The researcher did not explain on what basis he used in selecting the Department of Primary Education and Department of Media Studies. These studies are important to this study because they present the current researcher some information on how to conduct this research.

2.2.3 The use of Reporting Verbs in Other Genres

Reporting verbs are not solely utilized in academic discourse, these verbs are used in other genres like newspaper reportages. In news, reporters report issues either online or in newspapers and they use reporting verbs. It is worth highlighting some of the studies on newspaper reportages.

Floyd (2000) examined the use of reporting verbs in the press. The topic for the research was „The Reporting Verbs and Bias in the Press“. The qualitative study design was adopted for the research. The corpus for the research constituted reportage of the Persian Gulf War between Iraq and the opposing alliance in newspaper spanning between 1st August, 1990 and 15th March 1991. The study investigated the different ways that news reports identify the personal preferred styles of journalists. The research further investigated the manner individuals from diverse backgrounds were reported with the help of distinct reporting verbs. The data was analyzed based on favorable and unfavorable verbs. The research typically focused on whether the reporting verb is „*professed*“ or „*claimed*“ which possess pejorative meaning, or „*explained*“, „*announced*“ or „*pointed out*“, which typically have more constructive meanings. The results indicate that Reporting Verbs like „*asserted*“, „*stated*“, „*concluded*“, „*argued*“, „*promised*“ and „*maintained*“ are used by journalists in a more neutral sense. The reporting verbs that are viewed as favorable have some positive connotations or in other

words show that most of the publications' claims are accurate. Some of such examples are *reiterate*, *repeat*, *disclose*, *reveal*, *divulge*, *confirm*, *explain*, *say*, *tell*, *announce*, *points out*, *spell out*, and *state*. Typically, these reporting verbs are employed by journalists to report the statements of the educated, United Kingdom and United States references. Unfavorable reporting verbs like *allege* and *claim* were employed to publish the other side that is Iraqi sources. The findings showed that „*explain*“ occurred less with Iraqi speakers simply because journalists did not like to use those favorable to report issues of Iraqi speakers. This research is pertinent to the ongoing research because, it will help us identify the fact that reporting verbs are not only used in academic discourse but other genres too. Knowledge about this will help the current researcher know how to go about the current study.

Ruminda (2016) investigated reporting verbs in news stories. The qualitative research design was employed for this research. The data for the research constituted four online media platform. The online media platforms included *The Jakarta Post*, *New York Times*, *BBC*, and *CNN*. The purposive sampling technique was adopted in gathering data. Twenty-one (21) news articles were randomly selected. Eight articles were sampled from The Jakarta Post, four news stories were also taken from New York Times, four stories from BBC, and five from CNN. Quirk (1985) served as the theoretical framework. The results indicated that The Jakarta Post recorded twentyeight (28) reporting verbs, The New York Time recorded thirty-four (34) reporting verbs, CNN recorded twenty-seven (27) reporting verbs and BBC also recorded nineteen (19) reporting verbs. This means that in all, one hundred and eight (108) different types of reporting verbs were identified from the data. The verb *say* recorded the highest frequency with one hundred and ninety six (196) occurrences, it was followed by the verb *tell* with twenty (20) occurrences. The reporting verbs that appeared just once are *ask*, *assume*, *back up*, *complain* and *conclude*.

The semantic categories that were identified include *activity verbs*, *communication verbs* and *mental verbs*. A review of the research article indicates that the data was not enough. Only 21 news articles are not enough to represent news articles of four media houses. Twentyone (21) is not even enough to represent just one media house, how much more represent four media houses. The researcher could have increased the data size.

Nkansah (2013) also carried out a study on the use of reporting verbs and viewpoint in newspaper Front Page articles of Newspapers in Ghana. This study was conducted in the Ghanaian context. This study adopted a number of concepts to constitute the conceptual framework. Thompson and Ye's (1991) categorization of reporting verbs constituted the theoretical framework. Qualitative research design was adopted as the research design. The source of data that was used for the study was made up of a collection of front-page stories of "Daily Graphic" and "The Ghanaian Times". The purposive sampling technique was used to select one hundred and thirty-six (136) Ghanaian newspapers. This is a clear indication that this research cannot represent the stand of all Ghanaian newspapers. Just two newspapers cannot be a representation of all newspapers in Ghana. The data set in other words was too small. The results of the study indicated that there were *writer's* and *speaker's* stance. For speaker's stance, there were positive, negative, and neutral verb categories. For the author's stance, the study revealed factive, counter-factive, and non-factive reporting verbs. In all, Daily Graphic recorded one hundred and eight (108) reporting verbs, and The Ghanaian Times recorded one hundred and sixty-one (161) reporting verbs. It was revealed in the research that journalists utilized uplifting reporting verbs because it recorded one hundred and seventy-seven (177) reporting verbs which represented 65.8% of the total percentage of the reporting verbs identified. In both publications, reporting verbs with a pejorative implication came second place and recorded twenty-nine (29) reporting verbs which

represented 10.8% of the total reporting verbs. Counter-factive reporting verbs ranked third in the reporting verb usage frequency with 19 reporting verbs representing 7.1%. Both non-factive reporting verbs and neutral reporting verbs captured (15) fifteen which formed 5.6%. The least number of reporting verbs were factive verbs and they recorded 14 that is 5.2%. It can be said that if the data set were increased, the data could have changed, hence this cannot represent the use of reporting verbs in front pages of Ghanaian newspapers. Due to this, I can conclude that the title of the article is inappropriate. The title could have been Reporting Verbs and Stance in Front Page Stories of Two Ghanaian Newspapers. This is related to present study because it will help readers to identify how reporting verbs are employed in the newspaper genre.

2.2.4 The Relationship between current study and Previous Studies

After careful review of literature, first, it was identified that most of the research works (e.g. Wu (2017), Agbaglo (2017), Ramaroka (2014), Loan and Pramoolsook (2015), Manan and Noor (2014)) have been carried out to examine the use of reporting verbs in scholarly discourse. While some studies (Manan and Noor (2014) and Loan and Pramoolsook (2015) have investigated the usage of reporting cross-culturally, others have investigated it from other perspectives like cross-disciplinary. While others have investigated the topic under discussion from one disciplinary perspective, others have studied it cross-disciplinary. With cross-disciplinary, little is known about the use of reporting among M. Phil students in the field of English, Mathematics and Agriculture. A review of literature shows clearly that reporting verbs are very pivotal in every research report. Again, a review of literature shows the paucity of research in the African context. To close this gap, the usage of reporting verbs in M. Phil theses written by Ghanaian graduates is something that has to be studied. This study is necessary because,

students are typically not taught how to use reporting verbs in research reports, again, research method classes do not discuss reporting verbs in research reports, and again, plagiarism is an unpardonable offense in academic writing. Knowledge about reporting verbs can serve as a guide for students in the selection of reporting verbs in their research reports. This study will again help to identify the type of reporting verbs that are used by M. Phil students in Ghana in writing their theses and the functions these verbs perform in research works.

2.3 Theoretical framework

The study employs Thompson and Ye's (1991) categorization of reporting verbs and Hyland's (2002) categorization system of reporting verbs as its theoretical underpinning. The two theories will be merged to serve as the conceptual framework.

2.3.1 Thompson and Ye's (1991) Classification of Reporting Verbs.

Thompson and Ye's (1991) classification of reporting verbs were adopted. They classified reporting verbs according to their meaning variance. They classified reporting verbs into two major groups or categories and they are *denotation* and *evaluation*. Thompson and Ye (1991) assert that writing professionals utilize reporting verbs to present their own thoughts or arguments as well as to show how they feel about others' assertions. Thompson and Ye (1991) proposed two major categories of reporting verbs. They established the *writer's act* and the *author's acts* under the denotation category. This is also known as the one quoting who wrote a text, that is, the *writer* and the quoted voice whose words are mentioned, that is, the *author*. The *author's act* according to Thompson and Ye (1991) has three subcategories i.e. *textual*, *mental* and *research verbs*.

Textual verbs are reporting verbs through which the writer's linguistic impression is displayed. Examples are *point out, state, mention* etc. The mental class verbs are verbs that typically imply cognitive operations. Examples are *believe, think* etc. The research verbs describe cognitive and emotional actions throughout the study procedures. Examples are *measure, find* etc.

The writer's acts also reveal the author's viewpoint towards the under-questioned by using a quotation from other scholars. These verbs are also sub divided into „comparison“ verbs and „theory“ verbs. The comparison verbs ascribe the writer's research to a certain point of view Examples are „correspond to“, „contrast with“ etc. Theorizing verbs are verbs that benefit writers through providing them with support of authors by giving them access to the author's research to help them improve their argument. Examples are *explain, support, agree* etc.

Thompson and Ye's (1991) categorization of reporting has been summarized in figure 3 below.

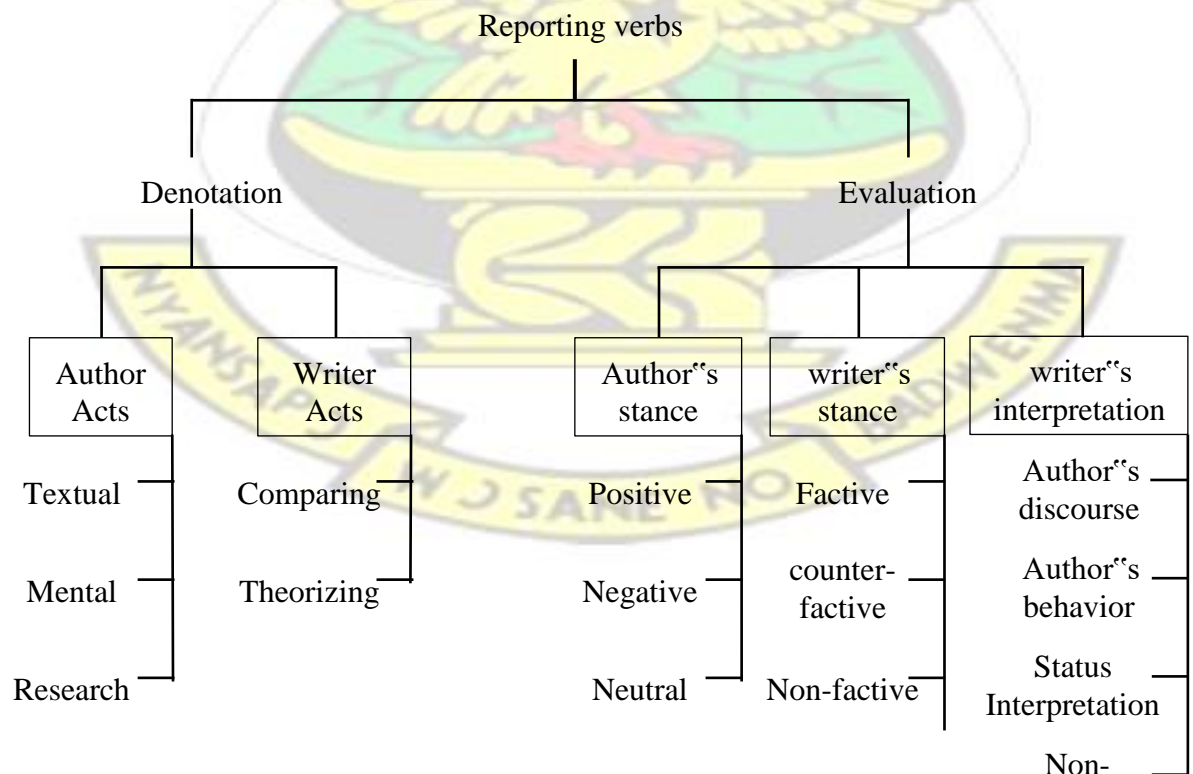


Figure 3: Thompson and Ye's (1991:371) classification of reporting verbs

Figure 3 above provides a description of the entire categorization of reporting verbs by Thompson and Ye (1991). Thompson and Ye (1991) provides a complex categorization of reporting verbs. A more revised classification of reporting verbs is explained below.

2.3.2 Hyland's (2002) Classification of Reporting Verbs

This study was guided by Hyland's (2002) classification of reporting verbs, the study was underpinned by model. Hyland (2002) classifies reporting verbs based on the activity they refer to. He classifies reporting verbs into three main types. These are *Research Acts*, *Cognition Acts*, and *Discourse Acts*. These classifications were first done by Hyland (1999) and were later developed in Hyland (2002).

Research Act Verbs according to Hyland (2002) refer to reporting verbs that represent or show experimental activities that occur in the actual world. These types of verbs appear typically either in assertions or results (e.g. *observe*, *discover*, *notice*, and *show*). Research Act Verbs include finding and procedure. The procedure verbs are used to indicate approaches or processes utilized in the referenced works examples of these verbs are *analyze*, *calculate*, *assay*, *explore plot*, and *recover*. With respect to the finding act verbs, the writers utilize factive verbs (e.g. *demonstrate*, *establish*, *show*, *solve*, *confirm*) to acknowledge the acceptance of the author's results or conclusions, counter factive acts (e.g. *fail*, *misunderstand*, *ignore*, *overlook*) are also used to show the writer's judgment as not true, unacceptable or wrong, and the last one which is nonfactive verbs (e.g. *find*, *identify*, *observe*, *obtain*) to indicate neutral attitudinal signal as to their reliability.

Cognitive Act Verbs according to Hyland (2002) are concerned with the investigator's cognitive process (e.g. *believe, conceptualize, suspect, assume, and view*). Cognitive Act verbs, which portray the cited work in terms of a mental process, handle evaluation rather differently and the writer here attributes a particular attitude to the cited author. The four sub-classes are positive attitude (e.g. *agree, concur, hold, know, think, and understand*) are selected when writers hold a provisional opinion about the reported subject that they consider as accurate and appropriate (e.g. *believe, doubt, speculate, suppose, suspect*), critical stance (e.g. *disagree, dispute, not think*) and neutral attitude (e.g. *picture, conceive, anticipate, reflect*). These verbs help the reader to know what writers think about what they are reporting.

Hyland (2002) indicates that Discourse Acts Verbs involve linguistic activities and focusses on the verbal expression of cognitive or research activities. Discourse Acts Verbs convey an evaluation of the cited work or material. The writers either take responsibilities for their interpretation, conveying their uncertainty or assurance of the correctness, or attributing a qualification to the author. In detailed explanation, the verbs that express the author's view directly are categorized or grouped into doubt and assurance groups. The doubt category can be sub-divided into tentative verbs (e.g., *postulate, hypothesize, indicate, intimate, suggest*) and critical verbs (e.g. *evade, exaggerate, not count, not make a point*). The assurance category introduces cited material in more positive and conclusive terms, either to neutrally inform readers of the author's position (non-factive verbs like *state, describe, discuss, report, answer, define, summarize*) or to use that position to support the writer's own (factive verbs such as *argue, affirm, explain, note, point out, and claim*). In the counter category too, the verbs (e.g., *deny, critique, challenge, attack, question, warn, rule out*) considered as the quoted

writer's own concerns or denials of the claimed statement's accuracy. The above explained model has been summarized in the Figure 4 below.

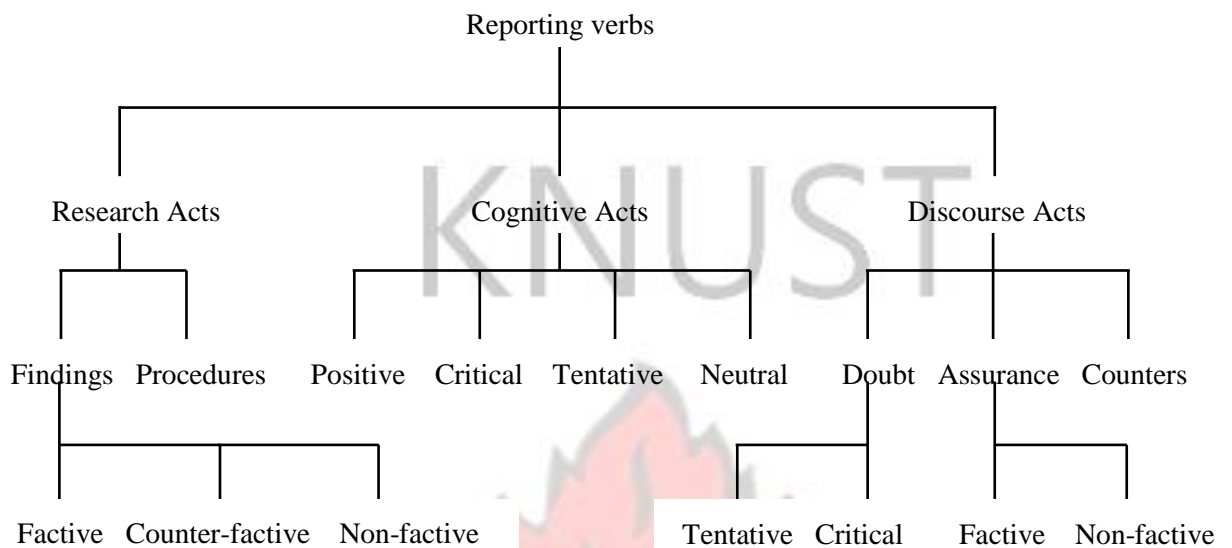


Figure 4: Categories of Reporting Verbs (Hyland, 2002:119)

2.4 Conceptual framework

Both Hyland's (2002) and Thompson and Ye's (1991) classification of reporting verbs were merged to get a conceptual framework for the study. Part of Hyland's (2002) model was used to identify the reporting verbs in the data sets. Part of Thompson and Ye's (1991) categorization of reporting verbs was also employed to identify the functions of the reporting verbs. Parts of both theories were conceptualized to obtain a framework that helped in the analysis of the data. This has been summarized in the table below.

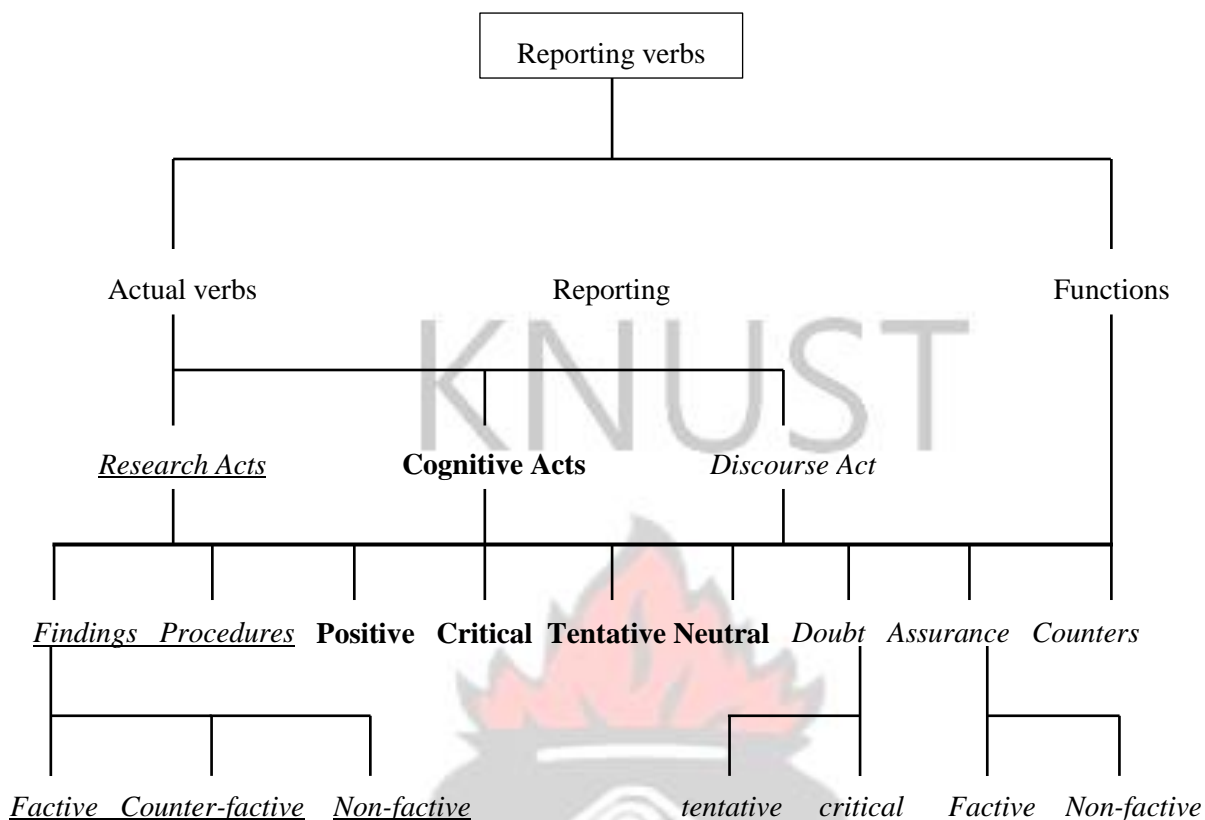


Figure 5: Conceptual Framework

2.5 Chapter Summary

Ultimately, the literature analysis consisted of theoretical and conceptual principles adopted for the research in addition to empirical literature related to the current study. Some main topics like reporting verbs, academic discourse, literature review, and thesis writing were also discussed in this section. Specifically, the review has established the fact that reporting verb usage will vary from discipline to discipline. The review also established that it is not only discipline that can affect reporting verb usage in academic discourse but culture can also bring about change in reporting verb usage in discourse. A variety of reporting verbs are available and authors have a catalogue of reporting verbs they can choose from. Writing guidelines and instructions, research method classes do

not speak much about reporting verb employment in theses. Again, writers' competence level show how well they can use reporting verbs well in their writings.

KNUST



CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter describes the procedures, steps, and approaches that were adopted to collect data used in this research. This chapter discusses the study design, research instrument, data gathering methods and methodologies used in data analysis for the current study. Section 3.1 presents the study design for this research, section 3.2 also contains the sample and sampling technique, the research site is presented in section 3.3. Section 3.4 presents the data size or source. The data collection procedure is presented in section 3.5. Section 3.6 presents the analytical framework and methods of analysis. The difficulties encountered are shown in section 3.7. Section 3.8 summarizes the entire chapter three.

3.1 Research Design

The mixed method approach was employed for this research. The mixed approach simply deals with the employment of both qualitative and quantitative research techniques in one research work. In other words, the mixed method refers to a type of study method that is employed to conduct studies which deals with gathering, analyzing, and merging qualitative and quantitative data in a single piece of study. The number one reason for the adoption of the mixed approach in a study is that both qualitative and quantitative study approaches when used together offers an effective and clearer comprehension of the study conundrum than one of the approaches used alone. Creswell (2014:132) indicates that “the mixed method is an approach to investigation involving both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical framework”. The

mixed method collects both quantitative and qualitative data, aims to confirm and expand on discoveries, and approaches investigations in fair manner.

The selection of the mixed method approach in this current study enables the researcher to describe and interpret, in detail, the frequency and distribution of the chosen linguistic variables as well as to illustrate them. This is done typically in an attempt to understand the rhetorical orientation and distribution of reporting verbs across three disciplines. Walliman (2004) indicates that a mixed method approach is most often effective in obtaining data in descriptive studies. Harvey (1990) also holds the same view. This study again adopted the mixed method because this present study addresses a lot of relatively unexplored questions and it not certain which method will be very suitable to produce the actual replies. Also, it is clear that adopting both quantitative and qualitative research designs shall produce a more inclusive and comprehensive results than one of them used alone. Quantitative approaches are very good to gauge the relevancy of qualitative thoughts since they help to quantify qualitative ideas.

Again, qualitative study approach gives the investigator an opportunity to explore naturally existing occurring phenomena in their complexity. Data is typically expressed predominantly in non-numerical terms. The qualitative research design helps to elicit results that the quantitative data could not have provided. Quantitative research design on the other hand uses specific measurement of variables. It typically involves simple frequency and means. For this, the data is analyzed in numerical terms.

The qualitative method was adopted to answer research question one, which is, the distribution of reporting verbs in theses of Master of Philosophy in English, Mathematics and Agriculture students in KNUST. The quantitative research design was adopted to answer the second research question. And these were the frequency of

occurrence of reporting verbs among Master of philosophy students of English, Mathematics and Agriculture. The qualitative research design was adopted to find answers to research question three, that is, the functions of reporting verbs in the literature review section of English, Mathematics and Agriculture disciplines.

The descriptive research method was used in this research. This method according to Babbies (2005) helps to describe “what occurs” in relation to the objectives being examined and learn about the state of a phenomenon. Grix (2001) also holds a similar view and he asserts that the descriptive research design enables the investigator to acquire data about the status of a phenomenon. The descriptive research design therefore helped to identify information about the state of reporting verbs. This method again helped the researcher to describe certain qualities and characteristics of the theses being investigated. Again, this design was adopted due to the fact that the researcher at some stage looked into the research’s relevant concerns. Through this, the researcher gathered new knowledge this was included to the theories existing on reporting verbs in scholarly discourse.

Robson (1993) believes that any research design, methodology, or technique chosen must be suitable for addressing the posed research issues. It is for this reason that this study adopted the descriptive research design. Mason (1996) also holds the view that researchers must take into consideration how data will be collected, data sources, and the information’s viability or if the approach selected may help in providing a coherent and cogent response to the research questions put forth. The researcher took all these into consideration before selecting the research design, that is, the descriptive research design.

3.2 Sample and Sampling Technique

The study adopted two primary sampling techniques. These sampling methods are the purposive and the simple random sampling. Walliman (2005) indicates that purposive sampling is a very suitable sampling technique that enables researchers to gather data from a representative sample of the community that one believes is knowledgeable about the topic and can assist researchers in gathering the right type of data. With respect to purposive sampling, the researcher solicits for specific elements which satisfy some predetermined criteria.

In research works like that of this current study, the researcher selects data based on his/her own judgments. Due to this, the researcher used this assessment on what he believes to be a true representation that can help answer the research questions. The researcher selected data for the study based on what can help him answer his research questions and can be a representation of the entire population. Due to this, the purposive sampling was adopted to choose solely master of philosophy theses from all the other fields of study in the KNUST. The purposive samples typically may not contain probabilistic sampling process since it is frequently not possible analyze the full population in one research. The purposive sampling technique was employed to choose Literature Review chapters of the master of philosophy dissertations across the fields of study. The literature review sections were selected if they meet these specified requirements: First, the literature review should be a distinct chapter and not attached to any other chapter of the theses. Also, the thesis also needs to be a master of philosophy thesis and be available online in the university's electronic database. The purposive sampling method assisted in choosing data that gave credible answers to the study questions (Creswell, 2014). Again, the purposive sampling technique was adopted to choose only master of philosophy theses in English, Mathematics and Agriculture and

not another field of study because of the objective and research questions for the present study. The researcher selected these three disciplines because he wanted to have a representation for soft, hard-life and hard-non life disciplines and so did that with the English, Agriculture and Mathematics respectively. Walliman (2005) indicates that the purposeful sampling is comparatively less expensive and simpler, and typically makes sure that only relevant samples are chosen and used for the investigation.

Also, only master of philosophy dissertations completed at the departments of English, Mathematics and Agriculture spanning the periods between 2000 and 2020 were used for the study. This constitutes theses between the 2000/2001 and 2019/2020 academic years. In selecting these samples, the convenience sampling technique was used. Those that constituted the sample were those that were available on the university's repository where theses are kept online. This method was used to help the researcher identify master of philosophy theses that were accessible online the era the study was conducted. This is because getting data of this nature is typically sometimes very difficult.

Hyland (2005) indicates that a substantial corpus may not most often describe a research effectively than a smaller one. Due to this, the convenience sampling technique was adopted to select data. A convenience sampling technique simply means selecting the needed theses from the entire accessible theses. Since a smaller corpus represents the study better, it was appropriate to select a sample from the total population.

There were forty-five (45) theses. There were fifteen (15) from the English department, fifteen (15) from the mathematics department and fifteen (15) from the agriculture department. The simple random sampling technique was adopted to help obtain data.

The sample size was determined using the probability sampling method known as simple random sampling.

3.3 Research site

In selecting the research site for the present study, four parameters were looked at. These parameters are proximity, the institutional context, language use and social units. These parameters will be explained in the subsequent paragraphs.

The institution used for the study is the Kwame Nkrumah University of Science and Technology, Kumasi. With regards to proximity, three reasons called for the choice of KNUST. First and foremost, the researcher is affiliated to the University. The researcher is a graduate student in the KNUST, due to this, carrying out the study in this university saved time and limited resources available. KNUST was again selected because no study has been done on the usage of reporting verbs in scholarly writing at this study location. Adopting this research site has therefore helped extend research of this nature as far as geographical location is concerned.

With regards to language use, the official medium of instruction in KNUST is English. Per the constitution of the Republic of Ghana and per Ghana's historical linkage with Britain, the official language that is used in all formal functions is English and since KNUST is a formal academic institution, the language used there is English language. The language policy in Ghana also selects English as the official language in universities in Ghana. Due to the language legislation in Ghana, it is expected that lecturers and students converse in English in all settings being it formal or informal. Despite this policy, some students use Ghanaian language or Pidgin English in informal settings.

As an annual ritual in all higher education institutions in Ghana, M. Phil and PhD. candidates in KNUST are expected mandatorily to submit printouts and electronic

versions of their research reports to the School of Graduate Studies in fulfilment for an M. Phil degree and Doctor of Philosophy degree respectively in all departments. These theses before their acceptance are assessed by both internal and external examiners, oral examinations are also conducted on them and later uploaded on the university's electronic database to improve upon the university's image to the academic community

An institutional repository is a collection of functions provided by an institution to its key stakeholders for the storage and distribution of copyrighted content produced by the institution and its affiliates. Basically, it is an organizational behavior to the storage of these digital information, which include management, assessing, and dissemination and also long maintenance and protection where necessary. (Lynch, 2003). Afful (2016) indicates that for a university, this includes materials like books, electronic versions of academic journal articles and also electronic theses and dissertations (ETDs)

In KNUST, three disciplines were selected for the research. These are English, Mathematics and Agriculture. These selected disciplines belong to the College of Humanities and Social Sciences, the College of Physical Science and the College of Agriculture and Natural Resources. English belongs to the College of Humanities and Social Sciences; Mathematics also belongs to the College of Science and Agriculture belongs to the College of Agriculture and Natural Resources.

The English Department is one of the departments under the Faculty of Social Sciences in the KNUST, Kumasi. The English Department runs BA English programme, M.Phil. English programme and PhD. Literature. It is because the department runs the M.Phil. English programme that is why it qualifies to be part of this current research since the focus of this research is on M. Phil theses. The Department of English was selected due to a number of reasons. First of all, the researcher is an M. Phil student with the department of English and so selected that department due to proximity. It will be a little

easier getting data from this department. Again, the English department was selected to make room and represent one of the youngest departments in the KNUST. Since the English Department is very young in KNUST, it was prudent to make a representation for them to know how students in that department use reporting verbs in their thesis. Biglan's (1973) classification of disciplines also categorizes English under pure-soft-non life discipline. There was the need to represent such discipline. Also, since students of English are believed to be very good with respect to the usage use of English, it was logic to study how students in that department use reporting verbs. Again, the Department of English was chosen because it runs an M.Phil. English programme. Due to this, a number of M. Phil students have graduated from this department and so data was available.

Also, the Department of English was chosen because the researcher wanted data from students with language background and as such fell on that department. The students make conscious efforts to study English and as such studies the grammar of English. Since these students study language scientifically, it was appropriate and prudent to study such students with respect to how they use reporting verbs in theses. Also, English Department was selected because, according to Afful (2005), that discipline values the scientific study of language in the broader sense and writing specifically as an effective and important strategies for teaching language. Since students in this department specifically study rules and grammar of English, it will be intriguing and appropriate to identify the manner master of philosophy graduates in a department like that employ reporting verbs in writing their literature review chapters. The dissertations for the current study were obtained from literature and language fields in the department of English.

The second discipline selected for the study is mathematics. According to Hyland (2009), Mathematics is a hard discipline and the research wanted to represent the hard discipline in this research. Biglan's (1973) classification of disciplines also puts mathematics under the pure-hard-non life discipline. This study specifically wanted to find the distinction between the use of reporting verbs in the hard and soft fields of study. Since there are a lot of M.Phil. programmes, it is obvious data was available for the study. The theses sampled for the study cut across all programmes listed above, that is, Applied Mathematics, Mathematics Statistics, Pure Mathematics and Actuarial Science. The Mathematics Department was again chosen because as far as reporting verbs are concerned, the department has received less attention. This department again does not really focus on the use of language as compared to English department. It was therefore chosen to represent such disciplines.

The third discipline that was chosen was the Agricultural discipline. The Agricultural discipline is part of the college of Agricultural and Natural Resources. All departments under the faculty of Agriculture qualified to be part of the dataset for the Agriculture Discipline. These departments include The Department of Agricultural Economics, Agribusiness and Extension, The Department of Animal Science, The Department of Horticulture, and The Department of Crop and Soil Science. M.Phil. theses from all these departments are what the researcher refer as Agriculture theses. The researcher was interested in Agriculture theses and so made use of M. Phil theses from these departments since they all had elements of agriculture in it. The bottom line was that the theses must be related to agriculture and so did not take into consideration the departmental segregations.

According to Biglan's (1973) categorization of scholarly disciplines, Agriculture is an applied-hard-life discipline. The selection of the agriculture field of study is also due to

the fact that, particularly in Ghana, it has not been heavily represented in interdisciplinary studies like biology, physics and Engineering. That is, this discipline was selected because it is a comparatively new field of study that has changed quickly and has aided the raising demand of food in Ghana. As agriculture is the backbone of Ghana's economy, it is necessary to study it. Agriculture as a model discipline in the sciences, recognizes the value of expanded writing in the academia (Casanave and Hubbard, 1992), and it will be exciting to see how master students use reporting verbs in their extended writings. The availability of data on the institutional archive site also influenced the choice of this discipline. Thus, the KNUST institutional repository site had most master of philosophy theses from the field of study, which was sufficient to respond to the issues raised by this research. More significantly, this discipline was chosen because it is "a field of study that permits investigators to better interpret data when compared to other fields of study" (Shokouhi and Baghsiahi, 2009:540).

In general, the three fields of study were chosen due to the scarcity of interdisciplinary research works featuring the three disciplines, particularly in the usage of reporting verbs. Researching on these three disciplines would thus help us to better understand the use of reporting verbs among students from these disciplines. The reason for selecting the KNUST as research site is that, no research of this nature has been carried out in this university as far as I am concerned. It was therefore prudent and necessary to choose this institutional context to fill the lacuna.

3.4 Data Size/Source

With regards to data size, forty-five (45) master of philosophy theses by students from the departments of English, Mathematics and Agriculture were selected purposefully. The theses were completed between 2000 and 2020. The chosen theses were theses that were defended and passed by their respective departments. The selection of the data took

into consideration the danger of the use of large corpus and the use of small corpus. The selection of forty-five (45) theses is also supported by past research works like Afful (2016) who used forty-five (45) theses, Musa (2014) who also used thirty (30) theses and Akoto (2011) who also used forty (40) masters theses. This study embraced the fact that the literature review sections are very bulky and lengthy that is why only 45 theses were selected. Each Literature Review section was an average length of 5900 words. Table 1 indicates a summary and distribution of the data across the three disciplines.

Table 1: Pages and word count breakdown for the chosen field

Field of Study	Category	Sum of thesis	Volume of words
Agriculture	M. Phil. LRs	15	77576
English	M. Phil. LRs	15	84868
Mathematics	M. Phil. LRs	15	66327
Total		45	228771

Source: Field Study, Owusu (2022).

Table 1 above presents statistic information relating to the total number of the theses and of their corresponding literature review chapters. The table indicates that there are little distinctions in the word count for each department's received theses, which can be described by the fact that there are distinct theses structures, based on the complicated nature of the writer's research topics and the variety of the disciplines and topics that have been dealt with and studied. Gil-Salom and Soler-Monreal (2014) asserts that the discourse room given to the literature reviews in each thesis was identified to be similar and so there can be an empirical research on the sample, despite its phenotypic variations.

The data for the research were selected from the university archive sites and this was done due to a number of reasons. First, scholars like Akbas (2012), Gil-Salom and Soler-Monreal (2014) and Afful (2016) have all conducted research and used data from these

sites. Also, Bhardwaj (2014) indicates that institutional repositories perform advertising functions and help market the institutions and promote the reputation of an organization. Due to this, universities upload rich and scholarly achievements made by associates of the scholastic team and society on to the site and shows them to world. Due to this too, it is clear that the university will upload only theses that met standard practices, the rules and conventions of an individual field of study's philosophy onto such a site. Therefore, selecting data from such a platform was in the right direction. Again, the institutional repository was selected because I needed only soft copies to carry out my research. It was unfortunate theses from the English department were not available on the institutional repository so I had to make photocopies from the English Department library then make photocopies then type them again to be able to get access to the soft copies. The AntConc corpus analytics platform examines data in plain texts format (.txt) format and for that matter, the softcopies of the dissertations, and not the printed versions, were more appropriate and preferred for the study to aid the examination. Ultimately, the printed versions were not easily accessible and there was not enough time to take the copies and type them and so there were no option than to select those on the institutional repository site.

3.5 Data Collection Procedure

I downloaded fifteen (15) theses from KNUST's institutional repository website in order to collect data from the mathematics department for the study. Fifteen (15) theses were also collected from the Department of English for the study since the available theses on the university's institutional repository were not current. Since the researcher needed soft copies for the study, the fifteen (15) theses were taken from the Department of English's library and photocopied. The photocopied theses were later typed to enable the researcher get the soft copies. The researcher again downloaded theses from the

agriculture discipline that were available on KNUST's institutional repository. The data were then converted to word then subsequently to plain text. In all, the data for the study constituted forty-five (45) theses.

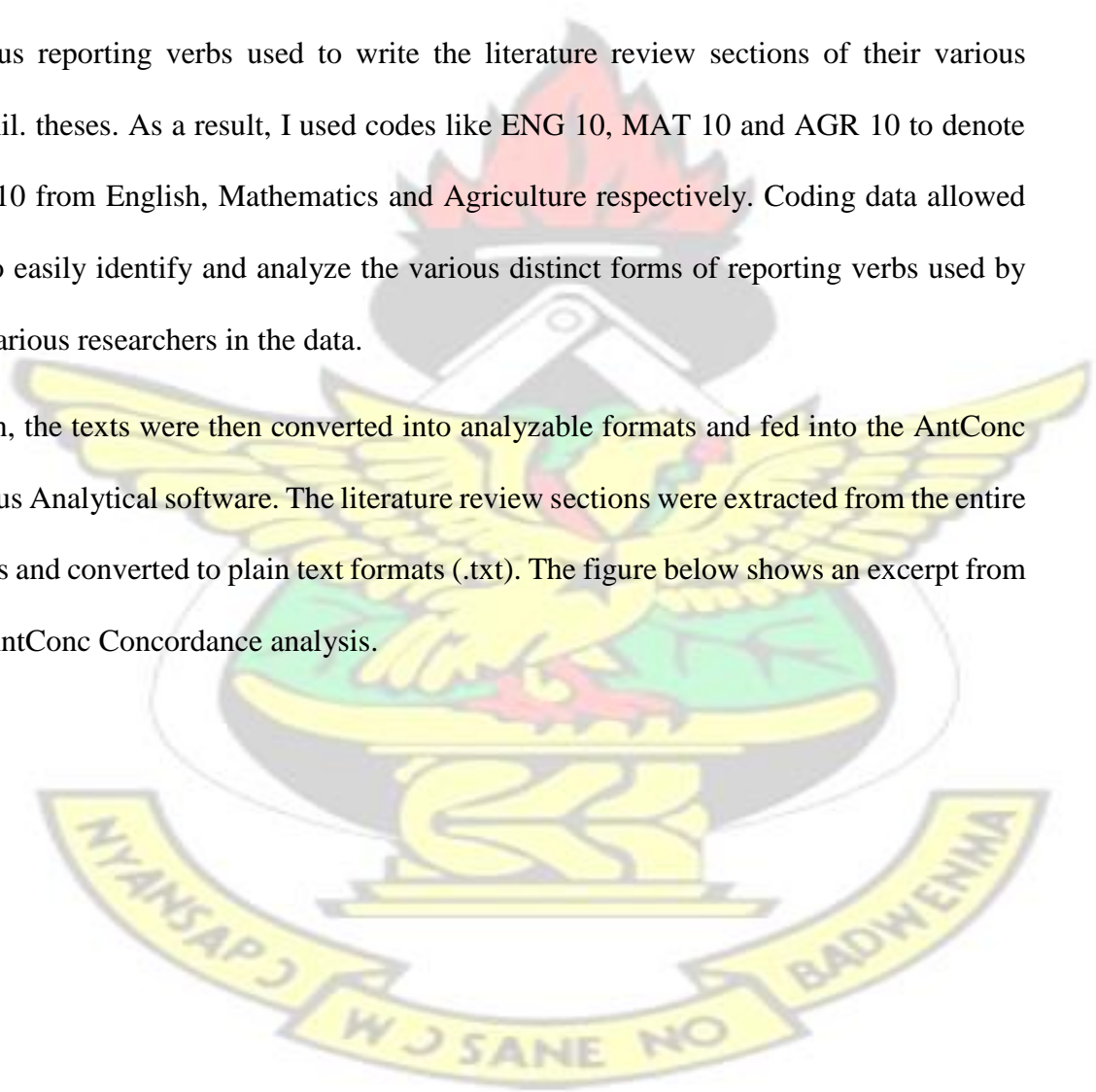
According to the theory of saturation in data collection, the forty-five (45) theses were sufficient for the study because they represented the "ideal quantity required to provide accurate conclusions about the population to be made (Marshall, 1996: 522)". The theses were then classified by discipline, and fifteen (15) Literature Review sections were chosen at random from the downloaded theses from the Mathematics Department and Agriculture Department and another fifteen (15) were also selected from the typed theses from the Department of English. The same was done for the theses from the agriculture discipline. The theses from the mathematics discipline and Agriculture discipline were easily accessible and were available in Portable drive formats (.pdf). The theses from the Department of English were also available in word format. They were then converted to plain text format (.txt) to make the data possible by the AntConc corpus analytic software.

3.6 Analytic Foundation and Analysis Techniques

The current study's analytical framework is textual, and not dualist (textual and ethnographic), as proposed by Flowerdew (2000). In analyzing the textual data, I used the categorization of reporting verbs by Hyland (2002) and Thompson and Ye (1991), which was backed up by a comprehensive study. This allowed me to organize my analysis based on concepts that appeared from the analysis and to comprehend the ways in which the students from these disciplines use reporting verbs and the functions of these reporting verbs. The fact that content analysis is unobtrusive is a significant advantage (Musa, 2014).

I first coded the data gathered to be able to respond to the study issues, these were to discover the type of reporting verbs employed by Mathematics, English and Agriculture field of study as well as the functions of these reporting verbs in M. Phil theses from these three disciplines. I categorized the theses and labelled them as „ENG“ and „MAT“ and „AGR“ for English and Mathematics and Agriculture respectively. The codes were simply abbreviated versions of the three disciplines. In order to code the data, I numbered each of the fifteen (15) theses from each discipline from 1 to 15, and I highlighted the various reporting verbs used to write the literature review sections of their various M.Phil. theses. As a result, I used codes like ENG 10, MAT 10 and AGR 10 to denote data 10 from English, Mathematics and Agriculture respectively. Coding data allowed me to easily identify and analyze the various distinct forms of reporting verbs used by the various researchers in the data.

Again, the texts were then converted into analyzable formats and fed into the AntConc Corpus Analytical software. The literature review sections were extracted from the entire theses and converted to plain text formats (.txt). The figure below shows an excerpt from the AntConc Concordance analysis.



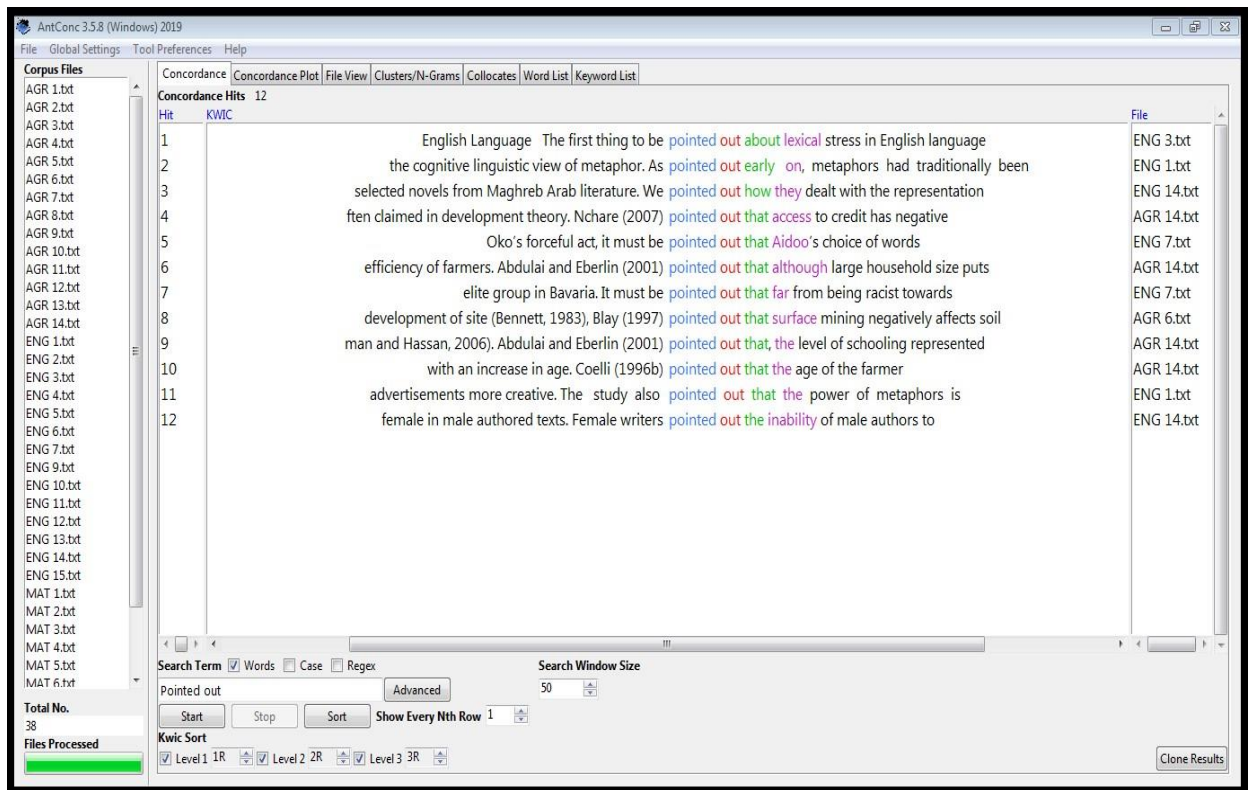


Figure 6: A sample of the AntConc Concordance Analysis. AntConc (3.5.8) windows 2019

I searched for the reporting verbs used in the literature review sections of the theses using Hyland's (2002) model of reporting verb classification and Thomson and Ye's (1999). I should mention that, while I was guided by Hyland's (2002) classification of reporting verbs and Thompson and Ye's (1999), I searched the entire text to examine other reporting verbs that did not appear in both models of reporting verb classifications. Each example was then analyzed and examined in its individual concordance line to ensure it functioned as a reporting verb and eliminated from the analysis if it did not. The clauses were the units of analysis, and I calculated the frequency of occurrence of the reporting verbs by going through each clause of the data.

3.7 Difficulties Encountered

This section discusses some of the difficulties I encountered while collecting and analyzing data for the study. During data collection, I discovered that there were very

few English theses on the KNUST institutional repository which were also out of date hence I found it difficult to get the data from that repository. I then had to take hard copies from the English department to make photocopies then type them to be able to get soft copies for the study. After getting the soft copies from the three departments, I realized that the literature review sections in some of the theses were not eponymous chapters. Some of the literature review chapters were thus merged with the introductory chapter (typically chapter 1), with few others embedded in the methodology section. Such theses were extremely difficult for me. To address this issue, I used purposive sampling to eliminate such theses and focused on those that had the literature review chapter as a separate chapter on its own (Bruce, 1994).

I encountered two difficulties while analyzing the data. The first step was to employ the AntConc corpus analysis tool. Working with the corpus tool was difficult for me at the start of my analysis because it appeared to be too technical and complicated for me. However, after discussions and coaching from my supervisor, as well as watching online tutorial videos on how the tool works, I was able to master its use for the intended purpose. I also had to abandon my original plan of manually analyzing the data in favor of a more rigorous corpus-based approach. Current studies on disciplinary variations appear to have shifted away from the traditional manual analysis of gathered data and toward the use of corpus tools to facilitate the analysis.

Finally, regarding the classification of reporting verbs using Hyland's (2002) model of reporting verb classification. It was difficult using the AntConc tool to identify the reporting verbs in the study.

3.8 Chapter Summary

The current chapter discussed the study's methodological orientations. The research designs used were both qualitative and quantitative, with an emphasis on content analysis. The research site for the study was also discussed under this section. The forty-five (45) theses submitted to the three departments under study were chosen using stratified sampling and purposive sampling procedures. To strengthen the claims of the qualitative analysis, the data were analyzed using qualitative content analysis, which was supported by descriptive statistics. The latter part of the chapter discussed issues that the researcher encountered during the course of the study, such as selecting literature review sections, using AntConc concordance tool, and identifying reporting verbs.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.0 Introduction

The reporting verbs used in the selected M. Phil theses are examined and discussed in this chapter. The discussions are given in regard of the study's research questions. In addition, the current chapter discusses qualitative and quantitative reporting verbs employed by postgraduate students in the three disciplines under investigation- English, Mathematics, and Agriculture. Section 4.1 reports the reporting verbs employed in the M. Phil theses. Section 4.2 presents the frequency of occurrences of the various types of reporting verbs used in the research works of postgraduates in the departments of English, Mathematics, and Agriculture in KNUST. Section 4.3 presents the functions of the reporting verbs identified in the data analyzed.

4.1 Reporting Verbs Employed in M. Phil Theses

The findings and interpretation in connection to the first research questions are reported in this section of the chapter. The first research question to be discussed is which reporting verbs are used in research works by Postgraduates in the Departments of English, Mathematics and Agriculture in the Kwame Nkrumah University of Science and Technology? The data was analyzed based on the conceptual framework for this study. In analyzing, it was realized that postgraduate students used all the three types of reporting verbs in varying degrees. The postgraduate students of KNUST employed reporting verbs from the Research Acts, the Cognitive Acts and the Discourse Acts categories to portray the perspectives of other researchers, as evidenced by the outcomes. It was identified that although the postgraduates from the Mathematics, English and Agriculture departments used Research Act, Cognitive Act and Discourse Act Verbs, they used them in varying degrees. This study will take the types of reporting verbs one after the other. The first one to be discussed is the Research Acts Verbs. According to Hyland (2002), Research Act verbs typically occur in the statements of findings (e.g., *observe, discover, notice, show*) or procedures (e.g., *analyze, calculate, assay, explore, plot, and recover*). The Research Acts verbs which are used to state findings are again sub grouped into factive verbs, counter-factive verbs and non-factive verbs. This grouping is based on their evaluative functions. Writers typically use the *factive verbs* (e.g. *demonstrate, establish, show, solve*) to acknowledge or show that they accept an author's result. Writers again use the counter-factive verbs (e.g. *fail, misunderstand, ignore, and overlook*) to show that they consider the author's judgments as false. The last category is the non-factive verbs like *find, identify, observe, and obtain*. Writers use this type to comment on research findings „with no clear attitudinal signal as to their reliability“ (Hyland, 2002:7).

Five examples each from the English, Mathematics, and Agriculture departments have been presented for illustration purpose. The examples below show how Research verbs were used in the data analyzed. The first to be discussed is the agriculture theses. This was coded AGR and the fifteen theses were numbered AGR 1 to AGR 15.

1. In fact, Yanan, Diner and Voet (1992) **show** that its influence can counter balance... (AGR 1).
2. McNamara et al. (1991) **demonstrate** the non-significance of the utilized agricultural... (AGR 1).
3. Cranfield and Magnusson (2003) **establish** that consumers are more likely to pay (AGR 5).
4. Roosen et al. (2004) **analyzed** food risk perceptions of German consumers (AGR 5).
5. Mainville and Peterson (2005) **explore** the potential to develop a cherry-apple... (AGR 5).

The examples 1 to 5 above show how Research Acts verbs were used to report the works and studies of other researchers in the agriculture data analyzed. As can be seen vividly from the examples above, *show* in example 1 is used to state facts factively, *demonstrate* in example 2 is used to report the findings of other researchers factively. Example 3 above has the research act verb *establish* which reports the findings of Cranfield and Magnusson (2003) factively. This typically means that the writer accepts the findings being reported. In example 4 above, the reporting verb *analyzed* was used in the procedure form, this is similar to example 5, in which *explore* was used to report the procedure Mainville and Peterson (2005) adopted for their study. Other Research Act Verbs identified in the agriculture thesis include *reveal*, *illustrate*, *demonstrate*, *confirmed*, *investigated*, *researched* etc.

According to the data, the tenses of the reporting verbs are not the same. This means that postgraduates use both present and past tenses of reporting verbs in their studies. Postgraduate students select the tenses of reporting verbs base on how they want to report issues.

Research Acts verbs were also seen in English thesis and examples have been reported below. This was also coded ENG. So, there were ENG 1 to ENG 15 thesis.

6. Bergh (2011) *explored* the use of war-inspired terminology... (ENG 5).
7. The finding *established* that the advertisement employed metaphors... (ENG 1).
8. Her studies *show* there are some cultural differences (ENG 4).
9. With CMT, Lewandowski (2012) *found out* that football is also conceptualized in terms of non-violent domains (ENG 5).
10. Also, Nahalami and Lin (1998) *conduct* a study on the intonation contours... (ENG 2)

According to Hyland (2002), *explored*, *established*, *show*, *found out* and *conduct* are all examples of Research Acts verbs. In example 6, the writer uses *explored* to report findings of Bergh (2011). In example 7 also, the writer uses *establish* to report findings factively. *Show* is also used to report findings in the factive way in example 8. Example 9 also has *found out* which is a finding verb to report findings of Lasaro (2016) in a non-factive manner. Example 10 also has *conduct* which is also a procedure research act verb. Other Research Acts verbs identified in the English thesis include *created*, *observe*, *reveal* *divides*, *found out*, *found*, *present*, *researched*, *analyze*, *studied*, etc. The results show that postgraduate students use both past and present tenses in citing other sources.

The examples below show Research Act verbs in the mathematics thesis of M. Phil students in KNUST. The examples have been randomly selected from the mathematics thesis.

11. Luckindill (1973) demonstrated that coexistence can be obtained where prey are ordered a refuge in which some portion of the prey population is exempt from predation. (MAT 12).
12. Yang (2000) showed how the basic reproductive number of malaria (MAT 7).
13. Smith et al. (2002) showed convincingly that landscape heterogeneity could help explain the irregular spread of the recon rabies virus across Connecticut, something which reaction diffusion framework had difficult achieving. (MAT 5).
14. Roosen et al. (2004) analyzed food risk perception of German consumers over the eleven year period from 1992 to 2002. (MAT 13).
15. Kha (2009) analyzed local pharmacokinetics and pharmacodynamics of angiogenic growth factors in myocardial tissue. (MAT 14).

The examples above show evidence of Research Acts verbs used in mathematics master of philosophy thesis in KNUST. In example 11, the writer used *demonstrated* to report the findings of Luckindill (1973) in a factive manner. Example 12 also has the research act verb *showed* and this also reports the findings of Yang (2000) in a factive way. This is also seen in example 13. Example 14 also has the research act verb *analyzed* and this reports the findings of Rossen et al. (2004). This reporting verb falls under the procedure type of research acts reporting verbs. This verb is also seen in example 15, the verb is also used to report the findings of Kha (2009). Other examples of research acts verbs identified in the mathematics thesis include *considered, explored, formulated, tested, discover, presented, found, observed, came out, obtained, made, derived, investigated, extracted etc.*

Other research works have also identified examples of research acts verbs in their studies and examples of such works include Agbaglo (2017), Iqbal and Anwar (2021), Un-udom

and Un-udom (2020), and Jafarigohar and Mohammadkhani (2015). All these scholars identified research act verbs in their studies. Jafarigohar and Mohammadkhani (2015) for example identified 473 research act verbs in their studies when they studied the use of reporting verbs in applied linguistics research articles by native and non-native speakers of English. Un-udom and Un-udom (2020) also recorded examples of reporting verbs in their studies. They recorded 58.4% of the total reporting verbs in the study. The study also identified some examples of finding and procedure research act verbs. It was only counter-factive research act verbs that were not recorded. Agbaglo (2017) also recorded examples of research acts verbs in his study. *Identified, examined, investigated, observed, and established* were some of the research acts verbs that were recorded in the study. Iqbal and Anwar (2021) also identified some examples of research acts verbs in their study and examples of such research act verbs include *find, interprets, concluded, and admits*. These are not the only studies that have identified research act verbs in their studies, these are only a few.

Aside Research Acts verbs, Discourse Acts verbs were also identified in the study. These students of KNUST employed Discourse Acts verbs in their thesis to report the findings of other scholars and authors. With respect to the evaluative types of discourse act verbs, it was identified that reporting verbs from the Doubt assurance categories were identified. With regard to the doubt type, verbs were used tentatively (e.g., *postulate, hypothesize, indicate, intimate, suggest*). Also, Assurance verbs were used from both the Non-Factive category (e.g. *state, describe, discuss, report, answer, define, and summarize*) and Factive type (e.g. *argue, affirm, explain, note, point out, and claim*). Directly critical *Counters*, on the other hand, were not employed in the data examined.

The following are excerpts from the data that indicate how Discourse Acts verbs were utilized. Five examples each have been adopted from the three departments. The first to discuss is the English thesis.

16. Further, Ofori et al. (2014) *indicate* that on grounds of legitimacy, the GhE is not recognized but that does not take away the fact that it qualifies for a variety.

(ENG 3).

17. Gerot and Wignel (1994:89) *indicate* that clauses can be combined through one lexico-semantic relation: expansion and projection. (ENG 12).

18. Thus, Perry (1977: 474-497) *suggests* that in discussion, clarification of indexical terms may rest largely on a diversity of extra-linguistic feature, like hand gestures and the common knowledge of the partakers. (ENG 11).

19. Adika (2012) *intimates* that English got rooted in the territory due to policies such as the „colonial and missionary language policy“ where English was the only language permitted for use in school and any infraction in this regard was not with punishment. (ENG 3).

20. As, Cognitivists, Lakkof and Johnson (1980; 1999) *note* that the experiencing or understanding process of the target and source involves a conceptual mapping or parallelism of source unto target, a cross domain mapping. (ENG 5).

In example 16 and 17, *indicate* was used from the doubt category to report the works of other authors tentatively. Example 18 also has *suggest* which is used from the doubt category to report findings tentatively. In example 19 also, *intimate* from the doubt category was used to report the findings of other authors tentatively. *Note* from the factive assurance type of discourse verbs was also used in example 20 to show support for the reported information. Critical verbs from the doubt category of reporting verbs were not recorded from the English data. Apart from that, tentative verbs from the doubt

category were recorded and evidence is seen in examples 16 and 17. Factive verbs from the assurance category were also recorded, example of such is seen in example 20. Non factive verbs were also seen in the English data examined and examples of such reporting verbs are *define*, *discuss*, *summarize* etc.

The next to be discussed is the thesis from the master of philosophy students from the mathematics department. Five excerpts have been randomly selected from the mathematics data.

21. MAFY (2009) *defines* academic performance and retention as a „process where a student’s success in school is measured to determine how they stand up to others in the same areas. (MAT 4).
22. The 2000 report of the WHO *suggests* that countries should be allowed to review their achievements in the area of maternal and neonatal health and compare their results with those obtained by other countries. (MAT 9).
23. Monaghan (1988) *described* a turbulence model for the particle method, Smooth Particle Hydrodynamics (SPH). (MAT 10).
24. Sara et al. (2010) *reported* an increase in temperatures and changes in patterns of rainfall as a result of climate changes are widely recognized to entail serious consequences for human health, including the risk of diarrheal diseases. (MAT 12).
25. Padberg et al. (2002) also *stated* that consumer behavior is a complex, multidisciplinary approach with contributions of different social science: economics, psychology, sociology, anthropology, geography, nutritional sciences and medicinal sciences.

In example 21, *defines* from the assurance category is used to report findings in the non-factive way. Example 22 also has *suggest* and is an example of doubt tentative discourse

act verb. In example 23, *described* from the non factive assurance verbs was identified. Example 24 also has *reported* from the same non factive assurance verbs. Example 25 recorded stated which is also from the non factive assurance verbs. This data set did not record examples of critical verbs.

Other Discourse Acts verbs identified in the mathematics thesis include *defined, generalized, estimated, originated, expounded* etc. Agbaglo (2017), Igbal and Anwar (2021), Un-udom and Un-udom (2020), and Jafarigohar and Mohammadkhani (2015) also identified some examples of discourse acts verbs in their studies. Examples of such discourse verbs include *intimate, discuss, claim, answer, summarize* etc.

Aside Research Acts verbs and Discourse Acts verbs, few Cognitive Acts verbs were also identified in the data sets for English, Mathematics and Agriculture thesis. According to Hyland (2002) cognitive acts verb is a type of verb that is typically concerned with the researcher's mental processes. Writers mostly use cognitive act verbs to attribute a particular attitude to a cited author. Hyland (2002) further went on to give examples of cognitive acts verbs as *concur, agree, hold, think* or *understand*, writers use these types of verbs when they have positive attitude to the material and that they accept it as true or correct. There is another category of cognitive acts verbs and that is the tentative category. Writers use the tentative verbs when they believe authors may be characterized as having a tentative view toward the reported issue and examples of such verbs include *believe, doubt, speculate, suppose, and suspect*. Writers may also hold a critical view and as such use verbs like *disagree, dispute, and not think*. The writer may also portray the author as having a neutral attitude toward the motion. Such views are expressed by verbs like *picture, conceive, anticipate, and reflect*.

As far as mathematics data is concerned, interesting results were seen as only four (4) cognitive acts verbs were identified in the data set. Below are examples of cognitive acts verbs that were identified in the data.

26. In the derivation of their model, Black and Scholes *assumed* assume ideal „condition“ in the market for the stock and option. (MAT 10)
27. Thus, Rode et al. (2007) *reasoned* that individuals with emotional intelligence would perform better academically. (MAT 4)
28. Mathew (2008) *realized* that the goal of most population pharmacokinetic and pharmacodynamics analyses is to develop a model that adequately describes the available data and that can be used for predictive purposes. (MAT 14)
29. Aaron and May (1982) *added* various characteristics of malaria to the RossMacdonald model, such as incubation period in the mosquito, a periodically functioning density of mosquitoes, super infection and a period of immunity in human. (MAT 7).

In examples 26 and 27, cognitive act verbs from the positive category of cognitive acts verbs were used. Reporting verbs from the tentative category of reporting acts verbs were also used. These are the only cognitive acts verbs that were identified in the mathematics thesis under study.

The examples below also show instances of cognitive acts verbs in agriculture thesis. It was surprising that there was only one cognitive act verb in the agriculture data.

30. The results *agreed* with previous findings obtained on other vegetable crops (Arisha and Bradisi, 1999; Al-Tarawreh, 2005).

The only cognitive act verb recorded in the agriculture data is *agreed* and this is an example of a positive cognitive act verb. No examples of critical, tentative and neutral cognitive acts verbs were recorded.

The examples below also show instances of cognitive acts verbs that were recorded in the English language data set.

31. This theory which was advanced by Black (1962, 1979a) *holds* that a metaphorical statement has two distinct subjects which are primary subject and a secondary subject. (ENG 1).
32. Black (1979: 27) *holds* that metaphors are resonant if they allow mappings from the secondary subject to the primary subject. (ENG 1).
33. Similarly, Moreley (2000:16) *agrees* that the organization of this semantic stratum is because all of them add up to the general sense of text's morphology. (ENG 12).
34. Ofosuhene (1997) does *not agree* with Freeborn et al that the lack of qualified teachers is not a contributory factor to the inability of schools to turn out students with satisfactory standards in English. (ENG 3).
35. Ofori, Duah, and Mintah (2014) however *side* with Dolphyne (1995) in identifying people who belong to GhE with their pronunciation of English. (ENG 3).

In examples 31, 32, 33 and 35, the writers used positive reporting verbs to report their positions. In example 34 also, the writer used does *not agree* to report the findings of Ofosuhene (1997). No tentative and neutral verbs were recorded in the study. Another cognitive act verb used in the data is *reject*.

To summarize the findings of research question one, it could be said that writers in the three departments used Research Acts verbs, Discourse Acts verbs and Cognitive Acts verbs. This is in agreement to what scholars like Agbaglo (2017), Muharromah and

Syarif (2019), Un-udom and Un-udom (2020), and Igbal and Anwar (2021) found in their studies. They also found all these three types of reporting verbs in their studies.

4.2 The frequency of occurrence of the various types of reporting verbs. The quantitative approach was adopted to help analyze research question two to identify the frequency distribution of reporting verbs in the disciplines of English, Mathematics and Agriculture in the literature review sections of master's thesis. The reporting verbs were manually counted and checked using the AntConc software. The results yielded a total of 1424 reporting verbs in the data gathered for the study. The distribution of reporting verb types in the literature review section of the various theses revealed varied patterns of reporting verb usage in academic writing. They were classified using Hyland's (2002) classification of reporting verbs. The result is presented in the form of table with the various categories of the reporting verbs used in the various disciplines. The study paid attention to both the process functions and the evaluative categories of reporting verbs as explained by Hyland (2002). This is done with three separate tables with one representing one discipline. The first table presents the results for the English data gathered.

From table 2, it is evident that the reporting verbs from the Discourse Acts category recorded the highest occurrence with four hundred and thirty-two (432) occurrences representing 68.1% of the data gathered as far as the English data are concerned. This is followed by Research Acts verbs which also recorded one hundred and seventy-eight (178) occurrences representing 28.1% of the total data set of the English department. The Cognitive Acts verbs recorded the lowest occurrences with twenty-three (23) occurrences which is 3.7% of the total English department data. These findings are in agreement with the findings of Agbaglo (2017), Yeganeh and Boghayeri (2014),

Jafarigohar and Mohammadkhani (2015) and Loan and Pramoolsook (2015) in which similar findings were found in their various studies. The agreement between these findings and those of Agbaglo (2017) and Yegenah and Boghayeri (2014) could be explained by the fact that they all focused on the English discipline. The current findings contradict with the findings of Manan and Noor (2013)'s findings. With Manan and Noor (2013)'s findings, Research Acts verbs recorded the highest frequency of occurrence (44.8%). This is followed by Cognitive Acts verbs which had 30.2 % of the total reporting verbs recorded in that study. Discourse Acts verbs recorded the lowest reporting verbs (25%) in the data set. The difference in the findings can be attributed to the fact that they are different departments.

Again, in the Discourse Acts category, *explain* recorded the highest frequency of occurrence (47 occurrences), followed by *note* (42 occurrences), followed by *refer*, *state*, and *indicate* which recorded 27, 19 and 17 respectively. There are a number of discourse acts verbs which also recorded varied numbers. *Reveal* was the highest used Research Acts reporting verb in the English data. It was followed by *proposed* which also recorded twenty (20) frequency of occurrences, *explored* also followed with twelve (12) frequency of occurrences. There were twenty-seven (27) other Research Act verbs which also recorded varied numbers. *Hold* recorded the highest frequency of occurrence (15 occurrences) as far as Cognitive Acts verbs are concerned.

Table 2: Frequency of occurrence of the English Reporting Verbs

TYPE/SUB-TYPE	FREQUENCY	PERCENTAGE
DISCOURSE ACT	432	68.2%
<i>Doubt</i>	86	13.6%
Tentative	86	13.6%
Critical	0	0%
<i>Assurance</i>	346	54.7%

Factive	190	30%
Non-factive	156	24.6%
<i>Counters</i>	0	0%
RESEARCH ACTS	178	28.1%
<i>Findings</i>	103	16.3%
Factive	75	11.8%
Counter-factive	2	0.3%
Non-factive	26	4.1%
<i>Procedures</i>	75	11.8%
COGNITIVE ACTS	23	3.7%
Positive	20	3.2%
Critical	3	0.5%
Tentative	0	0%
Neutral	0	0%
TOTAL	633	100%

The table below also shows the frequency of occurrences of the data set from the agriculture department of KNUST. From table 3 below, it is evident that verbs from the Discourse Acts category had the highest frequency. It recorded a total of 57.3% of the total reporting verbs in the theses of agriculture postgraduate students. This was followed by 42.4% of Research Acts verbs. Cognitive Acts verbs recorded 0.3% of the total reporting verbs used by Agriculture postgraduate students. Table 3 below shows the distribution of reporting verbs in the agriculture data set.

Table 3: Frequency of occurrence of Agriculture Reporting Verbs

TYPE/SUB-TYPE	FREQUENCY	PERCENTAGE
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DISCOURSE ACTS	227	57.3%
<i>DOUBT</i>	32	8%
Tentative	18	4.5%
Critical	0	0%
<i>ASSURANCE</i>	195 27	49.2% 6.8%
Factive	168 0	42.4% 0%
Non-factive	168	42.4%
<i>COUNTERS</i>	113	28.5%
RESEARCH ACTS VERBS	57 1	14.3% 0.3%
<i>FINDINGS</i>	55	13.9%
Factive	55	13.9%
Counter-factive	1	0.3%
Non-factive	1	0.3%
<i>PROCEDURES</i>	0	0%
COGNITIVE ACTS	0	0%
Positive	0	0%
Critical	396	100%
Tentative		
Neutral		
TOTAL		

Table 3 above presents the various categories of the reporting verbs used in the agriculture data analyzed. From the table above, it is evident the reporting verbs from the Discourse Acts category recorded the highest the frequency of occurrence which were two hundred and twenty-seven (227) reporting verbs representing 57.3% of the total reporting verbs identified in the agriculture data analyzed. This was followed by reporting verbs from the Research Acts category which recorded one hundred and sixty-eight (168) occurrences representing 42.4% of the total reporting verbs identified in the agriculture data. The Cognitive Acts verbs recorded the lowest with just one occurrence in the agriculture data analyzed. This represented just 0.3% of the total reporting verbs identified in the agriculture data. These findings are consistent with that of the findings of the English department. They are also consistent with those of Yehanah and Boghayeri (2014), Agbaglo (2017), Jafarigohor and Mohammadkhani

(2015) and Loan and Pramoolsook (2015), all of whom got similar results. Postgraduate theses can be classified as research works from experts since they are written and supervised by lecturers who are experts. The fact that they all focused on research works by specialists could explain the concordance between this finding and that of Agbaglo (2017), Yegenah and Boghayeri (2014) and Jafarigozar and Mohammadkhani (2015). The findings, however, contradict those of Manan and Noor (2013), who found that verbs in the Research Acts category had the highest frequency of occurrence (44.8%), followed by the Cognitive Acts category (30.2%), and the Discourse Acts category had the lowest percentage of the total reporting verbs identified in the agriculture data. The Discourse Acts verbs recorded 25%. The discrepancy can be explained by the two studies' distinct disciplines: the current study involves agriculture discipline whereas the previous study involved linguistic discipline.

Report which has one hundred and twenty-eight (128) occurrences was the reporting verb with the most occurrences in the Discourse Act category, followed by *define* with eighteen (18) occurrences and *explain* and *state* with sixteen (16) occurrences each.

Find had the most occurrences which is forty-eight (48) occurrences in the Research Act category, *reveal* followed with twenty-six (26) occurrences, *evaluate* also followed with fourteen (14) occurrences. *Show* also followed with twelve (12) occurrences. *Agreed* was the only cognitive act verb recorded in the agriculture data. According to Manan and Noor (2014), the verbs *found*, *suggest*, and *state* had the highest occurrences in the Research Acts, Cognitive and Discourse Acts categories respectively and this contradicts with the current study.

Table 4 below presents the quantitative analysis of mathematics data from KNUST postgraduate students.

Table 4: Frequency of occurrence of Mathematics data

TYPE/SUB-TYPE	FREQUENCY	PERCENTAGE
DISCOURSE ACTS	122	30.9%
<i>DOUBT</i>	54	13.7%
Tentative	54	13.7%
Critical	68	0%
ASSURANCE	19	17.2%
Factive	49	4.8%
Non-factive	0	12.4%
COUNTERS	269	0%
RESEARCH ACTS	126	68.1%
<i>FINDINGS</i>	93	31.9%
Factive	33	23.6%
Counter-factive	143	0%
Non-factive	4	8.4%
PROCEDURES	2	36.2%
COGNITIVE ACT	0	1%
Positive	2	0.5%
Critical	0	0%
Tentative	395	0.5%
Neutral		0%
TOTAL		100%

From table 4 above, it is evident that the reporting verbs from the Research Acts category recorded the highest occurrence which is two hundred and sixty-nine (269) occurrences representing 68.1% of the total reporting verbs identified in the mathematics theses. This is followed by the Discourse Act category which recorded one hundred and twenty-two (122) occurrences representing 30.9% of the total reporting verbs in the mathematics theses. The Cognitive Acts verbs recorded the lowest number of occurrences (4 occurrences), which is 1% of the total mathematics data. These findings are in agreement with the findings of Manan and Noor (2014) where the highest reporting verb identified was the verb from the Research Act category. The Research Acts verb recorded 44% of the total reporting verbs. The only difference between Manan and Noor's (2014) finding and this current research is that the second highest reporting verb for the current study is

from the Discourse Acts category (30.9) while that of Manan and Noor (2014) is the Cognitive Acts verb (30.2%). The least reporting verb used in the current study is Cognitive Acts verb (1%) and that of Manan and Noor (2014) is Discourse Acts verbs which recorded (25%) of the total reporting verbs in that data set. The difference in the results of the two studies may be due to difference in geographical settings. The findings of the current study are in disagreement with the findings of Yaganeh and Boghayeri (2014) and Jafarigohar and Mohammadkhani (2015) and Agbaglo (2017). The difference may be due to the fact that the above research works focused on the soft discipline while the current study focused on the hard discipline.

Again, in the Discourse Acts verbs, *used* recorded the highest frequency with twelve (12) occurrences, followed by *suggest* with eleven (11) occurrences. *Indicate* and *reported* followed with nine (9) occurrences each. Other reporting verbs followed with varying numbers of occurrences. With respect to the Research Acts verbs, *show* recorded the highest occurrences with thirty-five (35) occurrences, this was followed by *conducted* with thirty-two (32) occurrences, followed by *proposed* with twenty-five (25) occurrences, this was again followed by *did* with twenty-one (21) occurrences. Other Research Acts verbs followed with varying numbers of reporting verbs. Only four (4) Cognitive Acts verbs were identified in the mathematics data and with that, *assumed* occurred once in the data, *added* also appeared once in the mathematics data, *reasoned* also appeared once and *realized* also appeared once.

The table below shows the frequency of the various categories of the reporting verbs used in the three disciplines.

Table 5: Frequency of occurrence of the various categories of reporting verbs

TYPE/SUB-TYPE	FREQUENCY	PERCENTAGE
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DISCOURSE ACT	781	54.8%
<i>DOUBT</i>	172	12.0%
Tentative	158	11.1%
Critical	609	0%
ASSURANCE	236	42.8%
Factive	373	16.6%
Non-factive	615	26.2%
<i>COUNTERS</i>	342	0%
RESEARCH ACT	225	43.2%
<i>FINDING</i>	114	24.1%
Factive	273	15.9%
Counter-factive	28	0.2%
Non-factive	23	8.0%
<i>PROCEDURES</i>	3	19.1%
COGNITIVE ACT	2	2.0%
Positive	0	1.7%
Critical	1424	0.2%
Tentative		0.1%
Neutral		0%
TOTAL		100%

The table above presents the various categories of the reporting verbs used in all the data analyzed. The table paid attention to both the process functions and the evaluative categories of reporting verbs identified by Hyland (2002). As shown in Table 5, the reporting verbs from the Discourse Acts category had the highest frequency with seven hundred and eighty-one (781) occurrences, accounting for 54.8 percent of the reporting verbs found in the total data. The Research Acts category came in second with eightyfour (84) occurrences, accounting for 43.2 percent of the total number of reporting verbs in the data. The Cognitive Acts verbs had the fewest occurrences which were twenty-eight (28), accounting for only 2.0 percent of the total number of reporting verbs in the data.

The findings are consistent with those of Yaganeh and Boghayeri (2014), Agbaglo (2017), Jafarigohar and Mohammadkhani (2015), Loan and Pramoolsook (2015) and Igbal and Anwar (2021), all of whom got similar results. The fact that they all focused

on research works by specialists could explain the concordance between this finding and that of Agbaglo (2017), Igbal and Anwar (2021), Yaganeh and Boghayeri (2014) and Jafarigihar and Mohammadkhani (2015). The finding, however, contradicts that of Manan and Noor (2013) and Un-udom and Un-udom (2020), who found that verbs in the Research Acts category had the highest frequency of occurrence (44.8 percent) and (54.8 percent) respectively. The Research Acts verbs were followed by Cognitive Acts (30.2 percent) and Discourse Acts (35.12 percent) respectively. As far as Manan and Noor's (2013) work is concerned, Discourse Acts verbs recorded the lowest percentage of the total reporting verbs identified which was 25 percent. Un-udom and Un-udom (2020) also had Cognition Acts verbs recording the lowest percentage of reporting verbs in the total data which was 6.48 percent. The discrepancy can be explained by the two studies' distinct locations. The current study is sited in Africa whereas the previous studies were sited outside Africa.

percentage of reporting verb types used

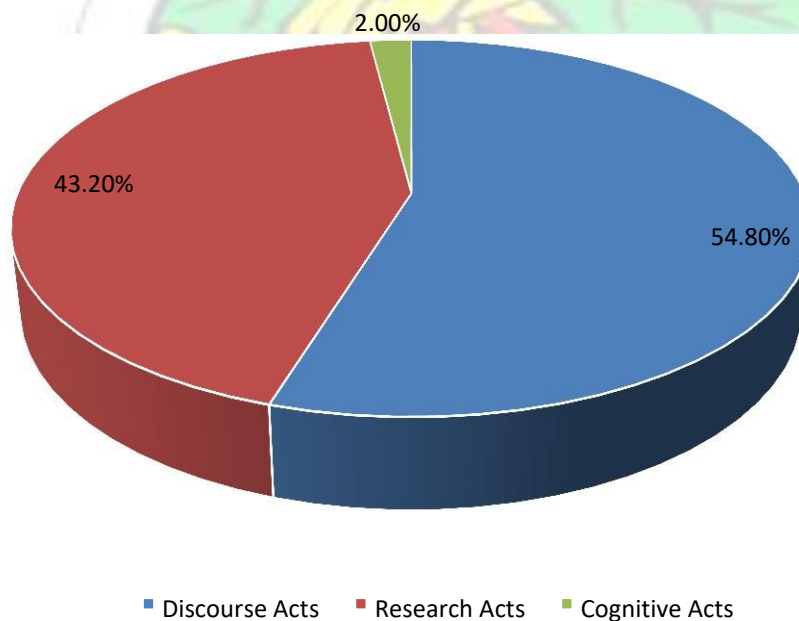


Figure 7: Percentage of types of reporting verbs

The most often occurring verbs in the above figure fall into the category of Discourse Acts, implying that postgraduate students of KNUST utilize Discourse Acts verbs more than any other category and this is consistent with Agbaglo (2017) and Hyland (2002) as they also found similar results. In Hyland's model, Discourse Acts verbs allow the writer to assess the referenced information by taking responsibility for his/her interpretation, expressing their perplexity or assurance that the claims recorded are correct, or attributing a qualification to the author. The chart above plainly shows that 54.8% of the reporting verbs fall under the Discourse Acts group. Research Acts verbs account for 43.2% of the total reporting verbs identified. The writer's perspective of a research activity is depicted using research act verbs. Two percent of the reporting verbs are cognitive act verbs. As a result, these verbs relate to the "mentioned work in terms of mental process, are discovered to handle evaluation somewhat differently" (Hyland 2002: 119). Instead of taking a personal viewpoint on the given material, writers use this class of verbs to express a certain attitude toward the mentioned work.

4.3 The Functions of the Reporting verbs identified in the data analyzed.

There were some interesting findings when it came to the evaluative roles of reporting verbs. Findings accounted for 24.1% of the total number of reporting verbs found in the data in the Research Acts category. Findings revealed that factive verbs appeared two hundred and twenty-five (225) times, accounting for 15.9% of the total number of reporting verbs identified in the data while non-factive verbs appeared one hundred and fourteen (114) times, representing 8.0% of the total number of reporting verbs in the data, and counter-factive verbs appeared only three (3) times, accounting for 0.2% of the total reporting verbs identified in the data. The presence of three (3) counter-factive reporting

verbs in the data is inconsistent with Agbaglo's (2017) research which did not record any counter-factive reporting verb. The distinction may be due to the difference in data size. The presence of only three (3) counter-factive verbs in the data supports Hyland's (2002) contention that authors rarely utilize counter-factive verbs when reporting information from other authors.

The examples below will be used to show how research act verbs function in context.

36. In fact, Yaron, Dinar and Voet (1992) **show** that its influence can counter balance the negative effect of lack of years of formal education in the overall decision to adopt some technologies. (AGR 1)

37. Mc Namara et al. (1991) **demonstrate** the non-significance of the utilized agricultural area. (AGR 1).

38. Wang et al (2011) **researched** that cholera is a severe water borne infectious disease caused by the bacterium vibrio cholerae. (MAT 1).

39. Robinson (1970) **found** a drop in organic and phosphorus under cupresus lestanica plantations compared with indigenous forest in Kenya. (AGR 1)

40. Foster et al. (2010) **failed** to achieve their objectives and attributed it to unexpected bait aversion. (AGR 7).

Loan and Pramoolsook (2015) indicate that Research Acts verbs are used to refer to research activities or experimental procedures. Research Acts verbs according to Hyland (2002) are used to state findings and also are used to state procedures. Those that are used in the statements of findings are further categorized into factive, counterfactive and non-factive verbs (Hyland 2002). Writers use factive verbs to acknowledge their acceptance of the author's results and findings, writers again use counter-factive verbs to consider the author's judgments as false and lastly, they use non-factive verbs to

comment on research findings „with no clear attitudinal signal as to their reliability“ (Hlyand 2002: 7).

From the examples above, there are five reporting verbs in examples 36, 37, 38, 39 and 40. In example thirty-six (36), the writer uses *show* to report the findings of Yaron, Dinar and Voet (1992) in a factive way. This means that the writer reports the findings as a fact. This means that reporting verbs are used to report facts. Example 37 also has *demonstrate* as the reporting verbs. *Demonstrate* is also a factive verbs and so is used to report the findings of Mc Namara et al in a factive way. Example 38 also has *researched* as the reporting verb used in the data. This verb is a procedure verb and for that matter is used to show the process adopted to arrive at the finding. It shows the action that took place before the findings were arrived at. It can be said that reporting verbs are used to show procedures. In example 39, *found* is the reporting verb used and it is an example of non-factive verb and it is used by the writer to comment on the findings of the author with no clear attitudinal signal as to its reliability. This means that the writer reports the findings not as a fact. Example 40 also has *failed* as the reporting verb used and it is an example of counter-factive verb and this is used to suggest that the findings are false. All these examples show how research acts verbs function in context.

Interesting results sufficed in terms of Discourse Acts verbs that either indicate the writer’s opinion (Doubt and Assurance) or assign an attitude to the cited author. There were one hundred and seventy-two (172) occurrences (12.0 percent) of those expressing Doubt, all of which were tentative reporting verbs. The lack of verbs expressing critical thoughts toward the authors listed suggests that these authors avoided approaching other authors’ viewpoint critically. The finding is consistent with that of Agbaglo (2017) and Loan and Pramoolsook (2015), who found no Critical verbs in the Doubt category. There were six hundred and nine (609) occurrences of the Assurance verb category in the data,

accounting for 42.8 percent of the total number of reporting verbs identified. Factive verbs accounted for 16.6 percent of the total reporting verbs identified, while non-factive verbs accounted for 26.6 percent.

However, the Counters verb group, which belongs to the Discourse Acts category of reporting verbs, did not appear in the data examined. The high frequency of Assurance verbs in the data investigated, as compared to Doubt and Counters, supports earlier findings (Hyland 2002; Loan and Pramoolsook's 2015; Agbaglo 2017; Un-udom and Un-udom 2020). Assurance verbs accounted for 71% of the total Discourse Acts verbs in Hyland (2002), followed by Doubt Verbs and Counters, which accounted for 24% and 5% of the total number of Discourse Acts verbs reported in the data, respectively.

Assurance verbs appeared four hundred and eighty-six (486) times in Loan and Pramoolsook's (2015) data, accounting for 53.42% of the total number of reporting verbs recorded. Doubts and Counters followed with 9.13% and 0.34% of occurrences respectively. Assurance verbs occurred ninety-eight (98) times in Agbaglo's (2017) data, accounting for 49% of the total number of reporting verbs recorded in the data. This was followed by Doubt verbs which occurred five (5) times and represented 2.5% of the total reporting verbs identified in the data. There was no Counter verb in the data. As far as Un-udom and Un-udom's (2020) work is concerned, the results were not different. Assurance again appeared five hundred and seventy-one (571) times and accounted for 28.28% of the total number of reporting verbs in the Discourse Acts verbs. This was followed by Doubt verbs that appeared one hundred and thirty-eight (138) times and represented 6.84% of the total Discourse Acts verbs. There were no Counters too. The low frequency of Counters in this and earlier studies (e.g. Hyland 2002; Agbaglo 2017; Un-udom and Un-udom 2020) implies that writers are unfamiliar with these verbs in general.

The examples below have been randomly selected to show the functions of the Discourse Acts verbs.

41. Geret and Wignel (1994: 89) *indicate* that clauses can be combined through one lexico-semantic relation: expansion and projection. (ENG 12).
42. The results of Maumbe (1999) *suggest* that the coefficient for the total area cultivated to cotton is positive and significant. (AGR 1).
43. Kachru (1996, 1997) and Huber (2012) *note* that countries that find themselves in the outer circle find themselves at the nativization phase. (ENG 3)
44. Lakoff and Johnson (1980) *explain* ontological metaphors as metaphors that occur as a result of our understanding of abstract things such as emotions and ideas on the basis of human experience of physical objects and substances. (ENG 1).
45. Scollon and Scollon (2003: 146) *state* that indexical expression (such as today, that, utterance and you) is a word or phrase that is associated with different meanings or referents on different occasions. (ENG 11)

From example 41, the reporting verb used is *indicate* and this is an example of reporting verbs from the doubt category. Specifically, it falls under the tentative category. Tentative category reporting verbs are used to report findings that are not certain or fixed. In example 42 above also, *suggest* is used tentatively to report the works of Maumbe (1999). This means that the writer is not certain with what is being reported. *Note* is used in example 43 above to report findings from the factive category. This means that the writer reports the findings of Kachru (1996, 1997) as a fact. It can be said that reporting verbs are used to report facts. *Explain* is also used in example 44 to also report facts since it belongs to the reporting verbs from the factive category. *State* is also used from the non-factive assurance category to report the findings of Scollon and Scollon (2003).

This means that it is used to report findings that writers do not see them as facts. It can therefore be said that reporting verbs are used to report non-factual findings.

Reporting verbs used to communicate positive posture, critical stance and tentative stance were recorded 23 times (1.7%), 3 times (0.2%), and 2 time (0.1%) in the Cognitive Acts verbs, respectively. However, the verbs employed to show neutral stance in respect to the material being reported were absent from the data. This observation is inconsistent with the findings of Loan and Pramoolsook's (2015) investigation and that of Un-udom and Un-udom (2020). While reporting verbs used to express tentative stance against the idea reported had fifty-one (51) occurrence (5.81), those used to express positive evaluation had 18 occurrences (2.05%), those used to express critical stance recorded no occurrence and those used to express neutral stance had seven (7) occurrences (0.80). As far as Un-udom and Un-udom's (2020) work is concerned, positive stance recorded 0.59% of the total reporting verbs used in the data, there was no critical verb, and there were 4.75% of tentative Cognitive verbs. Neutral verbs had 1.14% of the total number of Cognitive Acts verbs. These findings are inconsistent with the findings of the current study and this may be as a result of difference of settings.

The examples below will be used to explain the functions of cognitive acts verbs.

46. Black (1979: 27) **holds** that metaphors are resonant if they allow mappings from the secondary subject to the primary subject. (ENG 1).
47. Ofosuhene (1997) does **not agree** with Freeborn et al. (1993) that the lack of qualified teachers is not a contributing factor to the inability of schools to turn out students with satisfactory standards in English. (ENG 8).
48. Black and Scholes **assumed** assume ideal „conditions“ in the market for the stock and option. (MAT 10).

According to Hyland (2002), Cognitive Acts verbs deal with the researcher's mental processes. Hyland (2002) further goes on to explain that researchers use Cognitive Acts verbs to attribute a particular attitude to the cited author. With this, writers of research works can represent the author as having positive attitude to the material, accepting it as true or correct. In example 46 above, the writer uses the reporting verb *holds* to accept the findings of Black (1979). This means that some of the Cognitive Act verbs in this study perform the function outlined by Hyland (2002). Hyland (2002) again indicates that researchers are able to present findings in which they have tentative views about with the use of Cognitive Acts verbs. Presenting a tentative view means that the writer is certain about the information he or she is giving. So, in example 48, the writer uses *assumed* to present the findings of Black and Scholes, which means that he or she is not certain on what is being presented. Hyland (2002) again indicates that researchers use reporting verbs to take critical stance, thus researchers determine whether they are in agreement with a particular proposition or not. In example 47 above, *not agree* is used by the writer to show that Ofosuhene (1997) does not accept the findings of Freeborn et al. (1993). This current study does not find any neutral cognitive act verb in the data analyzed.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter presents summary of the study, which includes the key findings that emerged from the research. The conclusions and recommendations based on the study's findings are presented in this chapter. It also includes recommendations for further research. All of these are aimed at bringing the investigation to a clear conclusion. Section 5.1 provides a summary of the findings. The key findings are presented in section 5.2. Section 5.3 presents conclusion of the findings. Recommendations for further studies are presented in section 5.4.

5.1 Summary

The study set out to examine the types of reporting verbs used in the literature review section of the M. Phil theses written by postgraduate students in the English, Agriculture and Mathematics disciplines at Kwame Nkrumah University of Science and Technology in Ghana. Specifically, the study sought to find answers to the following research questions:

1. Which type of reporting verbs are used by postgraduate students of English, Mathematics and Agriculture disciplines in writing their theses?
2. What are the frequency of occurrences of the various types of reporting verbs used in the research works of postgraduate students of English, Agriculture and Mathematics disciplines in the Kwame Nkrumah University of Science and Technology?
3. What are the functions of the reporting verbs in the research reports?

The study was conducted using the mixed method approach. Purposive and simple random sampling procedures were used to draw the sample. The purposive sampling method was used to select M. Phil theses from all other academic writings of students in the Kwame Nkrumah University of Science and Technology for this particular study.

In addition, the purposive sampling method assisted in choosing M. Phil theses in English, Mathematics and Agriculture over all others. A simple random sampling strategy was used to sample a total of forty-five (45) theses. Fifteen (15) theses were chosen from the humanities (English) sector, Physical Sciences (Mathematics) and Natural Sciences (Agriculture). In most cases, descriptive, content, case, and inductive analyses were used to organize the data for the study.

5.2 Key Findings

Based on the analysis of data and discussion of the results, the following are the key findings. These findings are presented in relation to the three research questions. The types of reporting verbs employed by postgraduate students.

The study revealed that Discourse Act verbs, Research Act verbs and Cognitive Act verbs were all present in the English M. Phil theses of postgraduate students of KNUST. These reporting verbs appeared in varied numbers as far as the English language theses are concerned. With respect to the Discourse Acts verbs of the English language theses, doubt verbs were recorded. Under doubt verbs, tentative verbs were recorded, no critical verbs were also recorded. Assurance verbs were recorded. Under assurance verbs, all the two sub categories of assurance verbs were recorded. These sub-categories are factive and non-factive verbs. Under Research Acts verbs also, findings verbs appeared in the study. Under findings verbs, factive verbs were recorded, counter-factive verbs were also recorded, and non-factive verbs also appeared in the English literature review sections.

Cognitive Acts verbs also appeared in the literature review sections of the English language data. Positive cognitive acts verbs were recorded in the literature review sections of the English data. Critical verbs were also recorded but no tentative and neutral verbs were recorded as far as the English data is concerned.

With respect with the mathematics data, all the three types of reporting verbs highlighted by Hyland (2002) were recorded. These are Discourse Acts verbs, Research Acts verbs and Cognitive Acts verbs. These verbs were recorded in varied numbers. For the Discourse Acts verbs, verbs were recorded under both Doubt and Assurance categories of reporting verbs. Under the Doubt reporting verbs, tentative verbs were recorded but there were no critical verbs. Under Assurance verbs also, both factive and non-factive verbs were recorded in the mathematics literature review sections of M. Phil mathematics theses of students of KNUST. For the research acts verbs also, both findings and procedure verbs were identified in the literature review sections of the mathematics M. Phil theses used as data for the study. Under the findings verbs, factive verbs appeared in the data, non-factive verbs also appeared but there were no counterfactive verbs. Procedure verbs were also recorded in the mathematics data. For the cognitive act verbs, positive cognitive acts verbs were recorded, tentative cognitive acts verbs were also recorded but critical and neutral verbs were not recorded as far as the literature review sections of the mathematics data are concerned.

For the Agriculture theses also, all the three types of reporting verbs were identified. These are Discourse Acts verbs, Research Acts verbs and Cognitive Acts verbs. For the discourse acts verbs, both doubt and assurance categories were identified in the literature review section of M. Phil theses of Agriculture students of KNUST. With the doubt category, tentative verbs appeared in the data but there were no critical verbs. For the assurance verbs also, both factive and non-factive verbs were recorded in the data. For

the research acts verbs also, both findings and procedure verbs were identified in the data for the agriculture discipline. For the findings verbs, factive, counter-factive and Non-factive verbs were identified in the data. Procedure verbs were also identified in the literature review section of the M. Phil Agricultural Science data. For the Cognitive Acts verbs also, only positive cognitive acts verbs were recorded in the data. There were no critical, tentative and neutral cognitive acts verbs in the literature review sections of the agriculture M. Phil theses of students of KNUST.

As far as all the three data are concerned, reporting verbs from the three categories of reporting verbs were identified. This means that Discourse Acts verbs, Research Acts verbs and Cognitive Acts verbs were identified in all the three disciplines. With the Discourse Acts verbs, both doubt and assurance verbs were identified in the data. Tentative and critical verbs under the doubt verbs were also identified. Under the assurance verbs, both factive and non-factive verbs were identified in the study. For the research acts verbs also, findings and procedure verbs identified in the study. Under findings verbs, factive, counter-factive and non-factive verbs were all identified in the study. Procedure verbs were also identified in the study. Cognitive verbs appeared in the study. All the types of cognitive verbs except neutral verbs were identified in the literature review sections of M. Phil theses of postgraduate students of KNUST.

Frequency of occurrences.

The Study revealed that Discourse Act verbs occurred most frequently in the literature review section of the English theses, making a total of 432 (68.2%). This was followed by Research Act verbs with a total of one hundred and seventy-eight (178) (28.1%).

Cognitive Act verbs followed making a total of twenty-three (23) (3.7%). Similarly, it was realized that the Discourse Acts verbs also had the highest frequency in the literature review section of the agriculture discipline with two hundred and twentyseven (227)

reporting verbs making 57.3%. This was also followed by Research Acts verbs with one hundred and sixty-eight (168) reporting verbs making 42.4%. Cognitive Act verbs were the least with one reporting verb making 0.3% of the total reporting verbs in the literature review sections of the agriculture theses. Unlike the Agriculture and English disciplines, the results from the mathematics discipline revealed that Research Acts verbs recorded the highest frequency 269 (68.1%) of reporting verbs in the literature review section of the mathematics data. This was followed by verbs from the Discourse Acts category which also recorded one hundred and twenty-two (122) reporting verbs making a total of 30.9% of the reporting verbs in the mathematics data.

Cognitive Act verbs recorded four (4) reporting verbs making a total of 1% of the reporting verbs in the literature review sections of the mathematics data. These results are very interesting as a distinction can be drawn between the Mathematics and Agriculture disciplines which both belong to the same discipline which is the “hard discipline.” Although Hyland (2000) indicates that writers in the hard disciplines tend to use research act verbs, Agriculture which belongs to the hard discipline does not follow that. The students in the agriculture discipline rather use discourse act verbs. This may be because they belong to the hard life discipline. The life in them has made them not to follow how writers in the hard disciplines use reporting verbs. English indeed follows what Hyland (2000) has instituted as how students in the soft discipline use reporting verbs. Due to this, students in the English discipline use discourse act verbs more than the other two types of reporting verbs.

The results of the study revealed that the highest frequency of occurrence is Discourse Act verbs which recorded seven hundred and eighty-one (781) reporting verbs making 54.8 percent of the total reporting verbs identified in the study. With respect to

Discourse Acts verbs, Doubt verbs recorded a total of one hundred and seventy-two (172) verbs making up 12.0% of the reporting verbs in the literature review sections of the M. Phil theses that served as the data. Tentative verbs under the doubt category recorded one hundred and fifty-eight (158) reporting verbs representing 11.1 percent of the reporting verbs identified in the study. There were no critical verbs in the Discourse Acts Category. Assurance verbs also recorded six hundred and nine (609) reporting verbs representing 42.8 percent of the total reporting verbs identified in the study. The results again indicated that there were two hundred and thirty-six (236) reporting verbs (16.6%) under factive verbs. There were three hundred and seventy-three (373) (26.2%) of the total reporting verbs identified in the study. There were no counters in the reporting verbs identified. As far as the Research Acts verb category is concerned, there were a total of six hundred and fifteen (615) reporting verbs representing a total of 43.2 percent of the total reporting verbs identified in the study.

Findings verbs under the Research Acts category recorded three hundred and forty-two (342) reporting verbs representing 24.1 percent of the reporting verbs identified in the study. Factive verbs also recorded two hundred and twenty-five (225) (15.9 percent) of the reporting verbs in the study. Counter-factive verbs also recorded a total of three (3) (0.2 percent) of the total reporting verbs in the study. Non-factive verbs were 114 (8.0 percent) of the reporting verbs. Procedure verbs under the Research Acts category also recorded a total of two hundred and seventy-three (273) reporting verbs making 19.1 percent of the total verbs in the study. Cognitive Acts verbs also recorded a total of twenty-eight (28) reporting verbs making 2.0 percent of the total reporting verbs identified in the study. Positive verbs recorded the highest frequency under the cognitive act verbs making a total of twenty-three (23) reporting verbs representing 1.7 of the cognitive act verbs. Critical verbs followed with 3 reporting verbs making 0.2 percent of

the total cognitive act verbs. Tentative verbs also were two (2) and that was 0.1 percent of the total cognitive act verbs identified in the study. There were no neutral verbs in the study which means that postgraduate students of KNUST do not use neutral verbs when reporting works of other authors when writing their thesis.

Functions of the reporting verbs.

The finding of the study again revealed some functions of reporting verbs. The findings of the study revealed that reporting verbs are used to report findings of other authors when writing thesis. It was revealed that reporting verbs are used to report findings tentatively. It was also revealed from the findings that reporting verbs are used to report findings that writers see as facts and findings that they do not see as facts. It was again revealed that reporting verbs are used to counter other authors' findings. Reporting verbs again are used to report factive, counter-factive and non-factive findings according to the results of the study. Reporting verbs again are used to report procedures writers adopt in arriving at their findings. Reporting verbs again are used to report positive attitude towards some findings in a study according to the results of the findings of the study. Reporting verbs again are used to report critical and tentative opinions over other authors' findings.

5.3 Conclusion

The study found that Discourse Acts verbs are high frequency items in M. Phil thesis writing among KNUST postgraduate students. It was also observed that despite the fact that Discourse Act verbs are high in type and frequency to some extent, there are some variations according to the discipline and the sections of the thesis. In other circumstances, reporting verb usage is characterized by alternation in order to achieve diverse rhetorical ends, rather than a straight-jacket.

Secondly, based on the correlation between a certain discipline and a specific reporting verb, as demonstrated in this study, the use of reporting verb is a socially limited attribute. This means that one's discipline can influence the kind of reporting verb that is selected. It is clear that the writing is influenced by the presence of a community of practice. Patterns of use do not exist in isolation; they are part of academic fields' communicative routines. This implies that reporting verb usage appears to be inextricably linked to the various disciplines' epistemic frameworks and ways of understanding the world.

Again, in the thesis genre, the many varieties of reporting verbs mentioned in the study have a purpose. As a result, fostering the optimal reporting verb usage will necessitate a knowledge of the communicative aims linked with each kind, as well as the key propositions where it is used. Reporting verbs alternatives are also impacted by the customs of the academic discipline in which the thesis is being written, but they are also creations of the writer, given the parallels and differences in reporting verb usage between disciplines. Writers make personal decisions that deviate from any disciplinary norms in order to achieve their rhetorical goals. This could also be a sign of students' inability to switch between reporting verb types in order to meet the normative expectation in their disciplines.

Furthermore, reporting verb usage is extremely variable. There are several distinctions that give the reporting verb its character. There are a lot of standard reporting verb usage conventions in a given discipline, for example. When the topic is narrowed, a thesis written in a specific discipline exhibits a unique reporting verb usage characteristic. This indicates that the various levels must be considered in order to comprehend the reporting verb usage in a thesis.

5.5 Recommendations

Further research is needed to confirm the conclusions of this study, especially in terms of corpus size. This research looked at a little part of the bigger picture. For example, this study did not include theses from the natural sciences, arts, and the biological sciences. At the same time, the forty-five theses reviewed in this study appear insufficient to reveal typical reporting verbs patterns in the disciplines investigated. However, the research scheme described in this study might be expanded to investigate a bigger corpus and to test the quantitative findings of this study, possibly employing computer corpus-based approaches and a more comprehensive statistical analysis when resources allow.

Furthermore, the current study concentrated on the types of reporting verbs (discourse act verbs, research act verbs and cognitive act verbs) and the evaluative functions of reporting verbs. Other aspects of the verb, such as tense, aspect, modality, and voice could be studied further in terms of how they apply to academic writings. Another research can be conducted to look at the semantics of the various reporting verb types in academic discourse.

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APPENDIX A

MATHEMATICS M. PHIL THESES SELECTED

- Abdullai, T. (2015). *Using Atanackovic and Stankovic numeral method to investigate fractional order cholera model*. Unpublished M. Phil theses, Kwame Nkrumah University of Science and Technology. (MAT 9)

- Acquah, R. F. (2014). *Revised mathematical morphological concepts: Dilation, Erosion, Opening and Closing*. Unpublished M. Phil thesis, KNUST. (MAT 11).
- Adu-Sackey, A. (2010). *The mathematics of the vibrating membrane as applied to African drums with varying tension compared with those of constant tension: The case of the „Dunno“ and the „Atumpan.“* Unpublished M. Phil theses, KNUST. (MAT 1)
- Addo, K. M. (2012). *An SEIR Mathematical model for dog rabies. Case Study: Bongo District, Ghana*. Unpublished M. Phil thesis, KNUST. (MAT 3)
- Akuamoah, W. S. (2014). *Predator-Prey Model of Security forces verses criminals in a contemporary Ghanaian community*. Unpublished M. Phil theses, KNUST.
- Azu-Tungmah, G. T. (2013). *A Mathematical Model to Control the Spread of Malaria in Ghana*. Unpublished M. Phil thesis, KNUST. (MAT 12)
- Brantuoh, G. K. (2014). *Linear Pharmacokinetic Model Order Metabolism in the Liver*. Unpublished M. Phil thesis, KNUST. (MAT 14)
- Kafui, J. L. (2014). *Mathematical Model of Hepatitis B in the North Tongu District of the Volta Region of Ghana*. Unpublished M. Phil thesis, KNUST. (MAT 15)
- Kwara, K. (2012). *Modelling the risk factor of neonatal mortality in Ghana*. Unpublished M. Phil thesis, KNUST. (MAT 7)
- Mutawaki, S. (2011). *The Mathematics of the vibrating membrane: the case of the „Gungori“*. Unpublished M. Phil thesis, KNUST. (MAT 4)
- Ofori, M. M. (2009). *Mathematical Modelling of the Epidemiology of Varicella*. Unpublished. M. Phil thesis, KNUST. (MAT 13)
- Onwona-Agyeman, G. (2013). *Mashfree Approximation in Non-linear Black Isocholes Option pricing equation with transaction cost*. Unpublished M. Phil thesis, KNUST. (MAT 8)
- Owusu-Darko, I. (2011). *Application of generalized estimating equation (GEE) model on students " academic performance: A Case Study of Final year malk four students of KNUST*. Unpublished M. Phil thesis, KNUST. (MAT 2)
- Parker-Lampsey, G. (2012). *Quantitative Analysis of Approximate models to use the saint venent equations*. Unpublished M. Phil thesis, KNUST. (MAT 6)
- Yeboah, D. (2014). *Classification trees as a tool for decomposing inequalities in under-five mortality in Ghana*. Unpublished M. Phil thesis, KNUST (MAT 10)

APPENDIX B

ENGLISH M. PHIL THESES SELECTED

- Aduse-Poku, S. (2017). „*Crying wound*”: *A study of trauma in Adichie*’s *purple hibiscus and half of a yellow sun*. Unpublished M. Phil thesis, KNUST. (ENG 9)
- Adubofour, I. K. (2019). *Lexical stress in Ghanaian English*, Unpublished M. Phil thesis, KNUST. (ENG 3)
- Afrifa-Yamoah, D. (2019). *A study of the impact of Akan intonation in English in Ghana*. Unpublished M. Phil thesis, KNUST. (ENG 2)
- Asare, A. V. (2018). *The Exploration of clause complexing in the Editorials of “The Ghanaian Times.”* Unpublished M. Phil thesis, KNUST. (ENG 14)
- Amelordzi, R. S. (2016). *The Virgin and the Whore: A presentation of the female in the Nawel El Saadawt*’s *God Dies by the Nile, Two Women in one and woman at point zero and Hisham Mater*’s *in the country of men*. Unpublished M. Phil thesis, KNUST. (ENG 12)
- Baidoo, D. (2018). *Metaphor as a device for persuasion in advertising in Ghana: A case study of Airtel, Tigo and Vodafone*. Unpublished M. Phil thesis, KNUST. (ENG 1)
- Boatemaa, A. S. (2014). *Championing the cause of African Women: An analysis of Buchi Emecheti*’s *The Joys of motherhood, Tsitsi Dangeremgba*’s *Nervous Conditions* and *Ama Ata Aidoo*’s *Changes*. Unpublished M. Phil thesis, KNUST. (ENG 11)
- Gyimah, J. M. (2019). *Metaphors of football: the case of Ghanaian commentators*. Unpublished M. Phil thesis, KNUST. (ENG 5)
- Mensah, D. (2018). *An investigation into the use of personal pronouns in political discourse: a study of inaugural address of two Ghanaian presidents*. Unpublished M. Phil thesis, KNUST. (ENG 15)
- Poku, N. V. (2008). *Investigating English language deficiencies in training colleges in Ghana: the case of Wesley College*. Unpublished M. Phil thesis, KNUST. (ENG 8)
- Mamadu, H. (2019). *A comparative study of ideational grammatical metaphor in the inaugural speech and state of the nation address of a Ghanaian president*. Unpublished M. Phil thesis, KNUST. (ENG 4)
- Nyarko, A. G. (2018). *Abuse and Oppression: A Study of Okey Ndidi*’s *Arrow of Rain* and *Chimamanda Ngozi Adichie*’s *Purple Hibiscus*. Unpublished M. Phil thesis, KNUST. (ENG 6)

Omari, K. B. S. (2010). *The Impact of the use of pidgin on students' use of English Language: A case study of selected secondary schools in the three districts in Kwahu Area of Ghana*. Unpublished M. Phil thesis, KNUST. (ENG 13)

Oppong, S. P. (2019). *The Journey of the Heroine: a study of the theme of departure, initiation and return in Buchi Emecheta's Kehinde, Amma Darko's Beyond the Horizon and Chimamanda Ngozi's Americanah*. Unpublished M. Phil thesis, KNUST. (ENG 10)

Tidorchibe, T. E. (2014). *The generational link between Ama Ata Aidoo and Amma Darko: A case study of their prose*. Unpublished M. Phil thesis, KNUST. (ENG 7)



APPENDIX C

AGRICULTURE M. PHIL THESES SELECTED

- Abrokwah, A. O. (2015). *Screening of Maize (Zee Mays l,) inbred lines for tolerance to drought*. Unpublished M. Phil thesis, KNUST. (AGR 13)
- Addai, N. K. (2011). *Technical Efficiency of Maize Producers in three Agro Ecological Zones in Ghana*. Unpublished M. Phil thesis, KNUST. (AGR 14)
- Aetiba, J. P. N. J. (2015). *Field evaluation of levo 2.4l (botanical) for the management of crop and soil sciences*. Unpublished M. Phil thesis, KNUST. (AGR 12)
- Amedor, N. E. (2014). *Effect of soil amendments on the quality of three commonly cultivated lettuce cultivars*. Unpublished M. Phil thesis, KNUST. (AGR 8)
- Amenu, E. (2015). *Effects of post-harvest management on cassava production, processing and quality of starch produced during gari making*. Unpublished M. Phil thesis. (AGR 11)
- Antwi, A. (2009). *The assessment of the rehabilitation of a degraded mine site: a case study of community involvement in Amansie Resolute limited site*. Unpublished M. Phil thesis, KNUST. (AGR 6)
- Awuah-Kusi, G. (2016). *Climate change and sustainable development: an insight into perceptions of the Offinso south District*. Unpublished M. Phil thesis, KNUST. (AGR 2)
- Boateng, O. S. (2012). *Assessment of three white yams (Dioscorea rotundata) varieties for possible development into flour*. Unpublished M. Phil thesis, KNUST. (AGR 4)
- Eduku, A. (2014). *Laboratory studies on develop cassava bait to control insect infestation of cocoa beans using coffee beans weevils, Areacurus fasciculates (De Gear) (deopter;Anthribidae as model*. Unpublished M. Phil thesis, KNUST. (AGR 7)
- Kaburi, A. S. (2015). *The effect of three different rates of application of cattle dung on quality of two traditional leafy vegetables (Amaranthus crenatus and corchorus ontorius)*. Unpublished M. Phil thesis, KNUST. (AGR 10)
- Kumah, E. K. (2014). *Evaluating the quality, microbial load and pesticide residue on some selected vegetables in three major markets in the Ho municipality of the volta region*. Unpublished M. Phil thesis, KNUST. (AGR 15)

- Larbi, K. I. (2015). *Assessing the factors influencing IPM adoption in Ghana: the case of vegetable farmers in the Kumasi Metropolis*. Unpublished M. Phil thesis, KNUST. (AGR 1)
- Nyame, B. (2015). *Quality of Keitt Mango chips as affected by method of drying packaging and storage periods*. Unpublished M. Phil thesis, KNUST. (AGR 9)
- Owusu, M. A. (2009). *The assessment of market potential and Marketing prospects of organic fruits and vegetables in Kumasi Metropolis of Ghana*. Unpublished M. Phil thesis, KNUST. (AGR 5)
- Wilson, G. (2016). *Symbolic effectiveness and sarprophytic competence of selected indigenous Rhizobia isolates for ground nuts inoculation in northern Ghana*. Unpublished M. Phil thesis, KNUST. (AGR 3)

