CHAPTER 1: INTRODUCTION

1.0 Introduction.

This study is an investigation into Thematic progression in upper secondary English for Science and Technology (EST) texts from the perspective of Systemic Functional Linguistics (SFL). The data for this study comprise texts from Microsoft Encarta Encyclopedia. This encyclopedia is one of the resources for extracting authentic texts for EST lessons. This introductory chapter has nine sections. Section 1.1 provides the overview of the English for Science and Technology (EST) syllabus as outlined by the Ministry of Education, Malaysia. Section 1.2 provides the statement of the research area, Section 1.3 identifies the purpose of the study and Section 1.4 underlines the research questions that guide the study. The scope, significance, methodology and organization of the dissertation will be provided in Sections 1.5, 1.6, 1.7 and 1.8 respectively.
1.1 Overview of English for Science and Technology syllabus.

English is taught as a second language in all Malaysian primary and secondary schools in line with its status as a second language. Students are taught the English Language to enable them to use the language in everyday life, to further their studies and for work purposes.

To this end, a general English language syllabus has been developed in line with the way English is used in everyday life in Malaysia. Students are taught to use the language for interpersonal purposes, for informational purposes and for aesthetic (appreciation of beauty) purposes.

With the advent of globalization, Malaysians will need to be proficient in English as a medium for communicating with people from other countries and to enable students to access knowledge on the Internet and to network with people both locally and overseas.

The continuing emphasis on science and technology has made it essential for students to access information on science and technology in English. This requires them to listen to, read and present the information orally and in writing in the medium of English. To this end, the English for Science and Technology (EST) syllabus was developed.

The English for Science and Technology subject aims to provide students with the language basis to access and understand materials on science and technology and to express ideas and concepts in English.
As emphasis is placed on **accessing content**, so the ability to read and comprehend materials in English is the main priority. The English for Science and Technology curriculum enables learners to:

a) obtain information by reading and understanding *different text types* in science and technology in English.

b) obtain information by listening to and viewing texts on science and technology in English from audio-visual and electronic sources such as talks and television programmes;

c) access and understand information on the *Internet* and other *electronic media*;

c) present information on science and technology at an appropriate level in both the written and spoken form;

d) think critically in English and give their points of view on issues pertaining to science and technology.

The English for Science and Technology syllabus specifies the curriculum content to be taught over a period of two years. The curriculum is organized in a manner that reflects the way ideas and information on science and technology are obtained and made known to others in everyday life.

The Curriculum Content of the syllabus outlines three main sections, namely, the *Learning Outcomes* to be achieved by learners, the *Language Content* to be incorporated into the lessons, and the *Educational Emphases* to be woven into materials and activities.
The Learning Outcomes of the syllabus specify the skills to be achieved by learners in terms of obtaining information on science and technology, processing that information and presenting the information. Learners are required to obtain ideas and information about science and technology by listening to talks and lectures, viewing TV multimedia resources, and most importantly, by reading a variety of materials for English for Science and Technology. In demonstrating the understanding of these texts, students are required to read, write, and speak about the topic.

The Language Content outlines the special areas of grammar that are most relevant and appropriate to science and technology texts. It is assumed that the other areas of grammar have been taken into account in the general English syllabus.

Educational Emphases incorporates worldwide developments in education such as thinking skills, ICT skills and the theory of Multiple Intelligences.

The Learning outcomes must be organized in a manageable form for teaching, taking into account the time allocated for English in the time-table which is one hundred twenty minutes per week stretched over three forty minutes lessons. The three areas of language use, taken singly or in combination, are usually planned around a topic.

1.2 Statement of Problem

The emphasis of EST is to enable students in the Science stream from Forms 4 and 5 to obtain, process and present information on science and
technology. The students who had been exposed to General English since primary school are now exposed to EST. Are they prepared to comprehend texts and produce texts in the science and technology register? Do they have sufficient language competence to handle EST? Mackay & Mountford (1978) say that where science reference materials are in English, students need to acquire a considerably higher standard of language proficiency to enable them to comprehend and manipulate difficult intellectual material. Besides students, are the EST teachers familiar with the science and technology register and can they provide them challenging texts? Garinger (2002) points out that language materials used to teach students should engage them in critical analyses of different types of texts. This is to ensure ample information and activities are provided in developing good reading skills as the emphasis in the EST syllabus is the development of good reading skills. These are some of the stumbling blocks which need to be ironed out so as to ensure better teaching and learning.

Grades are not distinct indicators of a person’s language competency. A student with Grade A in PMR (Penilaian Menengah Rendah) English could not be deemed as not having any difficulty in grasping the content of science and technology texts sourced from various resources because the language of EST is more specialized. As Ary, Razavieh and Jacobs (1985) puts it, “a scientific inquiry is a very specific process which relates to control, manipulation and observation of situations and involves research assumptions, hypothesis formation and theory construction.” Students’ fresh from the General English syllabus, learned from primary to lower secondary, may find this specialized language very challenging and may get de-motivated.
To this end, the knowledge of Theme and Rheme may become useful. The knowledge of Theme and Rheme and Thematic progression could help to enhance teachers’ and students’ understanding of science and technology texts as one of the objectives outlined in the EST syllabus is to obtain information by reading and understanding different text types in science and technology in English.

1.3 Purpose of the study.

This study aims to examine how the EST texts are structured as a message from the theme – rheme perspective. Such a study is deemed necessary to ascertain the types of themes employed and how they are linked to produce a message in a science text. This knowledge will, to a certain extent, assist educators to determine suitable texts and strategies for teaching.

The study is also to examine the contribution thematic organization makes to the cohesive development of EST texts. The cohesion of a text determines the degree of understanding of a text. As Eggins (1994:299) claims “the most striking contribution of Thematic choices is to the internal cohesion of the text, which is skilful selections of theme produces text which ‘hang together and makes sense.’”

The study too will provide implications for the teaching of reading and writing in ESL situations. The teacher may use the thematic analysis of text as an approach to teaching writing. A student who understands the thematic structure and organization of a particular genre, in turn is able to put it to practice in his own writing.
1.4 Research Questions.

This study aims to answer three major questions. The research questions are as stated below:

1) What are the types of Themes found in EST texts?
2) What are the types of Thematic progression found in EST texts?
3) How are EST texts structured as messages from the perspective of Thematic Progression?

1.5 Scope.

A total of 7 broad areas (Themes) are considered for the teaching of EST in schools. These broad areas are referred as Themes in the EST syllabus. The existence of two Themes of different functions and meanings in the study may confuse readers. So to avoid confusion, the former keyword Themes will henceforth be referred as areas. The areas outlined in the EST syllabus are:

a. Nature and Environment : e.g. How the weather affects the lives of people
b. Technology and Communications: e.g. How information is stored for later use?
c. Energy/ Matter & Mass/ force & Motion; e.g. The principle of motion in roller coasters.
d. Man and Living Organisms : e.g. Anthrax as a bioweapon
e. Natural Resources and Industrial Processes : e.g. Energy from the wind
f. The Universal/ Astronomy/ Aerospace: e.g. The Hubble telescope.
g. Nutrition /Food/ Health/ Human Body: e.g. Genetically modified foods.
For the purpose of this research, only two areas are selected. Three texts from each area are then selected. These six texts structures would be scrutinized in terms of thematic choices and thematic progression. The selected areas are:

\textit{a) Nature and Environment}

\textit{b) Nutrition / Food / Health / Human Body}

This study only considers these two areas because the texts from these areas are more commonly selected by teachers for their EST lessons because they are closely related to the students’ environment and growth. The other areas, which are also of importance, are reserved for future studies.

\textbf{1.6 Significance of the study.}

The study of SFL literatures and past researches on Theme and Thematic progression had to some extent influenced the area of study for the dissertation. It has also lent a hand in clarifying concepts and supporting arguments put forth in this investigation. The rational for selecting six topics from the same source but of different areas is to ensure there is sufficient data to compare and contrast the thematic choices and the patterns of progression found in EST texts.

Linguists believe that the benefits of thematic analyses are extensive. They give insight to the author’s style in literary analysis. In language teaching, they provide text-structuring help to novice writers, e.g. when writers are learning to write their academic essays and papers. Besides that, the finding will also help in developing students’ reading skills and comprehension skills.
where they are required to understand texts on a number of science-related topics because the EST syllabus is more content-oriented. Its main focus is on students’ reading and understanding of ideas and information in a wide range of science and technical materials besides writing descriptions and reports in simple language. If one or two particular thematic choices and thematic progression patterns are dominant in this investigation, then the educator can effectively employ a common strategy to teach this register.

1.7 Methodology

This study brings in the Hallidayan Systemic Functional Linguistics (SFL) model of text analysis. SFL is a workable theoretical framework for the analysis of scientific and technological texts. This initiative is taken on two theoretical grounds. Firstly, SFL “interprets language as being a system network of meaning potential and describes language as being made up of systems, each having a set of features which are in contrast with one another.” (Morley, 1985:42) SFL thus accounts for paradigmatic relations of systems, which is it interprets language not as a set of structures but as a network of systems, or interrelated sets of options for making meaning.

Secondly, for Halliday (1990:34), SFL is particularly suitable for the type of investigation that enables us to analyse any passage and relate it to its context in the discourse, and also to the general background of the text on who it is written for and what its angle is on the subject matter.
1.8 Organization

This study will consist of 5 chapters. Chapter 1 has introduced the EST syllabus in the schools as outlined by the Ministry of Education Malaysia and provided aims of the study. Chapter 2 which is the Literature Review will consider all the literatures that were influential in providing the background knowledge to undertake this study. Chapter 3, the Theoretical Framework and Methodology component will elaborate on SFL as a suitable tool for text analysis. It will also look into Thematic structure and Thematic Progression whereas Chapter 4 on Findings and Discussions will analyse the raw data and reveal the findings of the study. Chapter 5, which is the Conclusion will summarize the findings of the study, provide the pedagogical implications and also look into directions for further research.

1.9 Chapter Summary.

This chapter has provided the background and the framework of the study. The three research questions in particular will serve as the guiding thoughts. So, the objective of the study is to seek answers for the three research questions. The next chapter, Chapter 2, will review the literature relevant to the undertaken study.
CHAPTER 2: REVIEW OF RELATED LITERATURE

2.0 Introduction.

This chapter provides an overview of literature relevant to the study. It is divided into six sections. Section 2.1 will provide the overview of English for Science and Technology and Section 2.2 will look into researches done in this area using non-SFL approaches. Section 2.2 will specifically provide an overview of language from the perspectives of Systemic Functional Linguistics whereas Section 2.3 will look into the theory of Systemic Functional Linguistics. Section 2.4 will focus on the notion of Theme-Rheme and Section 2.5 will provide insights into Thematic Progression.
2.1 Overview of English for Science and Technology.

English, being the second language in Malaysia, is taught in every primary and secondary schools. The language is taught so as to equip students with the necessary language skills for communication, educational pursuit and work purposes. But, over the years there has been continuing emphasis on the need for students to be more proficient in the language. It has become essential for students to be able to listen, to read and to present information orally and in writing on science and technology matters. Besides that, they are required to access knowledge on the Internet and to network with people both locally and overseas. The English for Science and Technology (EST) syllabus was developed in Malaysia by the Education Ministry to cater to this need. The EST syllabus focuses on language form which gives emphasis to the grammatical or structural aspects of language that is practical and content oriented. The EST syllabus specifies the curriculum content to be taught over a period of two years.

EST is a sub-category of English for Specific Purposes (ESP). So, it shares many characteristics of ESP. Dudley –Evans and St.John (1998: 4-5) note that the teaching methodology and language elements of ESP are different from General English.

EST is a register based English. Halliday (1993) defines ‘register’ as language distinguished according to ‘use’ not to ‘user’. So, individual style or idiolect has no place in register simply because the focus is on ‘use’ and not the ‘user’. Here, we are looking at language used to define, classify, report, explain, and prove. Clarity of concepts and logical thinking are very important cornerstones of scientific English. Keith Jones and Peter Roe (1975) in their
seminal paper “Designing English for Science and Technology” aptly point out that the central concern of EST is the accessibility of knowledge. The language in EST, therefore, is expected to help the user better describe, interpret and explain the various steps in the scientific process. For this purpose, vocabulary in the form of technical and scientific terms and language structures are also essential. Dudley-Evans and St.John (1998) suggest that linguistic structures such as modals that indicate degree of certainty (e.g. *may*, *might*, *could*, *would*, *zero article*), as well as nominalization of verbal nouns through suffixes (e.g. –*ation*, –*ity*, and –*ment*) may be relatively more important in EST than in General English. The purpose of EST is not to show how beautifully one can write, how wide one’s vocabulary is or how varied one’s sentence structures are, but rather to focus on its referential roles and functions.

### 2.2 Researches done on EST

Much research had been carried out on EST in the past on lexicon, syntax and discourse of scientific English. The earlier researches were carried out using generative – transformational grammar. Transformational grammar (TG) has to a certain extent revolutionized linguistics and has provided researchers with an accurate method of representing syntactic operations in language.

Three prominent researches on the syntax of scientific English based on the framework of TG grammar were carried out by Huddleston et al (1968, 1971), Gopnik (1972), and Cowan et al (1974). Huddlestons’ corpus consists
of scientific texts (biology, physics, and chemistry materials) taken from popular journals, textbooks, and specialist articles. Although the framework is largely TG, yet his approach has been influenced by Halliday’s ‘systemic’ model (1967, 1968). Gopnik, on the other hand, concentrated on 28 one-paragraph texts (250 words each) in experimental biology material from specialists’ papers. Apart from dealing mainly with inter-sentential structures, he also considers the problems of inter-sentential dependencies involving structures which are more than one sentence long. An important part of the study is semantic analysis of certain patterns of occurrence of transformations. Cowan, too was very selective in his study. His corpus was on 1500 sentences from various medical texts used at the University of Tehran. The study focused on the frequency of syntactic patterns that characterize this type of scientific prose.

The findings of the above studies have important pedagogic significance as they assist teachers in selecting the structures to be taught because they provide a fairly comprehensive inventory of linguistic structures found in some types of scientific prose.

While Huddleston et al (1968, 1971) and Cowan et al (1974) focused on discrete structural points, Gopnik (1972) focused on the interaction between and among sentences in a connected discourse. Exponents of discourse analysis like Widdowson (1974) feel that TG studies of EST are ‘cut off from the facts of usage, and anomalies arise as a result: the ill-defined phenomena of human language, for instance, are represented as a well-defined
system of generative rules.” Discourse analysis largely focuses on the description of the network of linguistic relations at inter-sentential and paragraph levels. Linguistic elements such as connectives, anaphora, cataphora, and reference which provide ‘grammatical cohesion’ is systematically studied (Hasan 1968, 1984,). In short, discourse analysis stresses on the reader’s ability to predict, recall, retrieve, synthesize, and critically assimilate information.

The above studies were done using non SFL approaches. Recent times have seen the emergence of studies on scientific texts influenced by Systemic Functional Linguistics (SFL). Research with an SFL orientation will be discussed in Section 2.6 after the introduction of SFL theory in Section 2.4

2.3 Overview of Language from the Systemic Functional Perspective

Language is a natural part of the process of living. It is used to interact with one another, to construct and maintain our interpersonal relations and the social order that lies behind them and also to amass the experience built up in the course of that process, both personal and collective. It is a tool for constructing meaning.

One school of thought in linguistics interprets language as a system of forms, to which meanings are then attached. The direction taken was first the study of the forms of words (morphology); then the forms of sentences (syntax) were explored in order to explain the forms of words. When the forms were established, the question “what do these forms mean?” was posed.
However, from the perspective of Systemic Functional Linguistics, language is viewed as a systemic resource for expressing meaning in context. This view of language as meaning potential implies that language is not a well defined system and language exists; therefore it must be studied in contexts such as professional settings, classrooms, and language tests. Grammar is a resource for creating meaning in the form of wordings. The question posed is “how are these meanings expressed?”. Language is seen as a means to an end, rather than as an end in itself (Halliday, 1994)

Applied linguists study language use in context, for example the contexts associated with specialized registers (e.g., business or academic), contexts for language learning (e.g. classrooms and study abroad programs), and contexts for language assessment (e.g. speaking tests and writing assignments). As a consequence many applied linguists are interested in linguistic theory that takes into account the contextual dimensions of language.

Due to the fact that language use differs from one context to the other, the ways in which human beings use language are classified in SFL into three broad categories known as metafunctions. They are:

a) **ideational metafunction**: Language is used to organize, understand and express our perceptions of the world and of our own consciousness. This function is further classified into two sub-functions or modes known as:
   i) **experiential function**: concerned with content meanings or ideas.
   ii) **logical function**: concerned with the relationship between ideas.

b) **interpersonal metafunction**: Language is used to enable us to participate in communicative acts with other people, to take on roles and to express and understand feelings, attitude and judgments.
c) **textual metafunction**: Language is used to relate what is said (or written) to the rest of the text and to other linguistic events. In other words, language is used to organize the text itself.

All three metafunctions operate simultaneously in the creation of meaning in relation to the context as illustrated in Table 2.1 below.

**Table 2.1**: The multifunctional structure of a clause complex drawn from Fries (1981)

<table>
<thead>
<tr>
<th>Textual Meta-function</th>
<th>// If he Brings the car we can use it //</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme 1</td>
<td>Rheme 1</td>
</tr>
<tr>
<td>structural</td>
<td>topical</td>
</tr>
<tr>
<td>Theme 2</td>
<td>Rheme 2</td>
</tr>
<tr>
<td>Theme 3</td>
<td>Rheme 3</td>
</tr>
<tr>
<td>Given</td>
<td>New</td>
</tr>
<tr>
<td>Interpersonal Meta-function</td>
<td>Subject Finite Pred. Complement Subject Finite Pred. Comp.</td>
</tr>
<tr>
<td>Mood</td>
<td>Residue</td>
</tr>
<tr>
<td>Ideational Meta-function</td>
<td>Actor Material Goal Actor Material Goal</td>
</tr>
</tbody>
</table>

Table 2.1 illustrates that:

a) each meta-function assigns its own structure;

b) these structures differ in important ways, though they partially overlap;

c) thematic structure and information structure form part of a complex of interlocking structures.
2.4 Overview of Systemic Functional Linguistic Theory.

Grammar is the system of wordings of a language. Thus, the system can be studied but a theory is needed in order to interpret it. A theory unravels the rich diversity of properties found in the phenomena being studied. Matthiesen & Halliday (1997) cite the example of two different theories interpreting light. One theory sees it as particles whereas the other looks at it as waves. Similarly, the physical phenomenon of the atom has been interpreted theoretically in terms of Democritus’ theory, Rutherford’s theory, and Bohr’s theory and so on.

There are two different theoretical perspectives of language in the West. Both strands of thought have their origins in Ancient Greece. The first sees language as a set of rules for specifying structures. Thus, grammar is a set of rules for specifying grammatical structures, such as the construction of a transitive sentence; verb + object. Here, sentence is regarded as the basic unit of language, organized on a logical model into Subject + Predicate and is studied in isolation. This perspective is that of logic and philosophy.

The second theory sees language as a resource, a resource for making meanings. Grammar is a resource for creating meaning by means of wording. Here, text is regarded as the basic unit of language, organized according to the rhetorical context and the sentence is studied in its discourse environment. This perspective is that of rhetoric and ethnography.

The first theory (language as a set of rules, rules for specifying structures) is usually presented in the schools in a diluted version. It presents the rules of grammar in terms of words in sentences, with words serving the functions such as Subject, Predicate, Object, and Adverbial. As a theory, it falls
far short of the demands that are now being made on understanding language in context. It draws too much from the European languages like Greek and Latin. Therefore, it is of limited value in interpreting the grammars of non-European languages such as Chinese, Tamil, Japanese, Indonesian, Tagalog or the languages of other regions and continents. Furthermore, it builds in too little of the overall grammatical system of language and allows us to see only a small fragment of grammar. It does not provide us with a way of interpreting the overall organization of the grammar of a language as a system of information.

Systemic – Functional theory is the response to the setbacks of transformational grammar that sees language as a set of rules, rules for specifying structures. It has its origins in the main intellectual traditions of European linguistics that developed following the work of Saussure. In the 1930’s, JR Firth and his colleagues in London worked on this theory. But the main development of this theory was carried out by his student MAK Halliday in the early sixties (see seminal paper, Halliday 1961). This theory was further developed in his work on the grammar of Chinese. Later, he established the department of linguistics at the University of Sydney. Through his teaching there, SFL has spread to a number of institutions throughout Australia, and around the world. Like other such theories, both those from the mid-20th century (e.g. Prague school, French functionalism) and more recent work in the same tradition, it is functional and semantic rather than formal and syntactic in orientation. It takes the text rather than the sentence as its object and defines its scope by reference to usage rather than grammaticality. Systemic Functional
theory’s immediate source is as a development of scale-&-category grammar. The name” systemic” derives from the term SYSTEM. SYSTEM in its technical sense is defined by Firth (1975) as the theoretical representation of paradigmatic relations, contrasted with STRUCTURE for syntagmatic relations. (extracted from Halliday’s entry on Systemic theory in the Encyclopedia of Languages & Linguistics. Pergamon Press) In short, SF takes the resource perspective rather than the rule perspective and it is designed to display the overall system of grammar rather than only fragments (Matthiessen & Halliday, 1997)

Systemic Functional theory views language as a social semiotic, a resource people use to accomplish their purposes by expressing meanings in context. “The value of a theory lies in the use that can be made of it, and I have always considered a theory of language to be essentially consumer oriented” (Halliday, 1985:7) The systemic approach is a very useful descriptive and interpretive framework for viewing language as a strategic, meaning-making resource. According to Halliday (1985), there are twenty one possible applications of systemic theory such as in linguistic education, stylistics, artificial intelligence and speech pathology.

This study focuses on language teaching in school, particularly English for Science and Technology. Functional English grammar can be utilized to teach the register of science and this view is in line with Lock’s (1996) in his introductory book on functional English grammar for teachers. He states that “grammar teaching is now very much on its way back into favour. However, it is important that there should not be a return to some of the practises of the past.” He advocates a systemic functional approach.
2.5 Text analysis using Systemic Functional Linguistics

The general application of systemic linguistics is to understand the quality of texts. Text analysis was seen as an “interpretive study” in traditional approaches to literary study. Interpreting a text involves stating WHAT a text means.

However, text analysis is regarded as an explanatory activity from a systemic point of view. A systemic analysis of a text aims to uncover and state HOW a text means.

Halliday (1985) suggests that there are two levels of analysis, understanding of the text and evaluation of the text. He views understanding as the lower of the two levels and that it is easily attainable. It involves using the linguistic analysis to show how and why, the text means what it does. The higher level which is the evaluation of the text involves using linguistic analysis to say why the text is, or is not an effective text for its own purpose – in what respects it succeeds and in what respects it fails, or is less successful. This level according to Halliday is very much harder to attain because it involves the interpretation of the environment, its context of situation and context of culture, together with how the linguistic features of a text relate systematically to the features of its environment, including the intention of those involved in its production.

In line with Halliday’s thinking, this study which is an investigation into Thematic Progression in upper secondary EST texts is based on the lower level of analysis which is the understanding of the text.
2.6 Past studies on Systemic Functional Linguistics

Applications of types of thematic progression to scientific texts have been carried out by Dubois (1987), and Nwogu and Bloor (1991) where both studies were based on naturally occurring data. While both found thematic progression Types 1 (Constant Theme Progression) and 2 (Simple Linear Progression) to be frequent, their findings differ with regard to the manifestation of Type 3 (Derived Theme Progression). Nwogu and Bloor (1991) found Derived Themes represented in their research article data but not in their more popular medical texts. Dubois (1987), on the other hand, found one single instance of this type while working with biomedical research texts.

Besides that, Ventola and Maureen (1991) based their study on 31 English academic journal articles written by Swedish-speaking employees of Helsinki University. Their findings revealed that Swedish-speaking writers to certain extent differ from their English colleagues in the handling of thematic development patterns. The Swedish-speaking writers’ writings show less thematic variation than the native writer’s text. They kept to one method of development, either Constant Theme Progression pattern or Simple Linear Progression pattern. The natives, on the other hand, employed a variety of patterns. The Swedish-speaking writers too used fewer textual themes and had less lexical cohesion between Themes.

Drury (1991) examined the language forms found in student summaries of a journal article using the Systemic Linguistic framework. The chosen summaries were part of an assignment set within the post graduate diploma course in teaching English as a foreign language at University of Sydney.
Hawes and Thomas (1997) carried out a study on Thematisation in Malaysian students writing ranging from lower intermediate to advanced level. They focused on the proportions of the various Theme types employed and thematic progression strategies.

Bloor and Bloor (1995: 90) suggest a connection between descriptive texts and the constant Theme pattern. This pattern is thought to be prevalent in the narrative texts, as narratives “tend to relate a sequence of events…. involving a common character or set of characters” (Fries 1983: 124). Holloway (1981) also holds that texts which are largely descriptive or narrative tend to repeat overall themes in the portion of sentences.

Other than Theme, cohesion has also been studied from the perspective of lexis, reference and conjunction using the SFL framework. Sriniwass (1996, 2004), looked at lexis of two chapters taken from two general chemistry textbooks to see how the resources of lexical cohesion were employed to create meaning. A lexical analysis was carried out applying a Firth- Halliday-Martin semantic relations theoretical framework. It was found that the Hallidayan model of language to explicate the text for its semantic relations was valid.

Francis and Kramer-Dahl (1991) in their research compared the writing of two neuroscientists, who use different styles to report, using the tools of thematic analysis and the description of processes, mood and modality. They were able to show how one of the neuroscientists “bridge the gap between distant and near experience, between scientific and everyday knowledge and between specialized and everyday audiences”.

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These past studies on SFL gave insights and orientation to this current study.

2.7 Overview of Theme

It could be assumed that in all languages the clause has the character of a message. “As a message structure, therefore, a clause consists of a Theme accompanied by a Rheme; and the structure is expressed by the order - whatever is chosen as the Theme is put first” (Halliday, 1994 : 37). The Theme “is not necessarily a nominal group. It may also be an adverbial group or prepositional phrase” (Halliday, 1994: 38).

Generally, the Theme can be identified as the element that comes in the first position of a clause and this definition is functional. The Theme may be a NOMINAL GROUP, ADVERBIAL GROUP or PREPOSITIONAL PHRASE, Table 2.2 illustrates the three different realizations of Theme.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Rheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher</td>
<td>has given the students a lot of work</td>
</tr>
<tr>
<td>(Nominal Group)</td>
<td></td>
</tr>
<tr>
<td>Last week</td>
<td>she was absent from school for two days</td>
</tr>
<tr>
<td>(Adverbial Group)</td>
<td></td>
</tr>
<tr>
<td>With confidence</td>
<td>he embarked on the difficult task</td>
</tr>
<tr>
<td>(Prepositional Phrase)</td>
<td></td>
</tr>
</tbody>
</table>

Frequently, the Theme is marked off in speech by intonation. It is spoken in a different tone group, especially when the Theme is either
(i) an adverbial group or prepositional phrase or
(ii) a nominal group not functioning as Subject

(Halliday, 1994:39)

EST texts mainly involve independent major clauses which are indicative in mood. An indicative clause could either be declarative or interrogative. If it is interrogative, it can either be polar interrogative (‘yes / no’ type) or content interrogative (‘WH-‘type)

**Table 2.3:** Types of indicative clauses.

<table>
<thead>
<tr>
<th>Mood : Indicative</th>
<th>Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Declarative</em></td>
<td>Children love games. Children don’t love games</td>
</tr>
<tr>
<td><em>Polar Interrogative :</em></td>
<td></td>
</tr>
<tr>
<td><em>Yes / no type</em></td>
<td>Do children love games? Don’t children love games?</td>
</tr>
<tr>
<td><em>Content Interrogative :</em></td>
<td></td>
</tr>
<tr>
<td><em>WH - type</em></td>
<td>Who love games? What do children love?</td>
</tr>
</tbody>
</table>

A typical pattern for Theme in a declarative clause is in which the Theme is conflated with the Subject and this is hailed as the UNMARKED THEME.

*e.g. The old man has lost his walking stick*

The phrase ‘The old man’ is both Subject and Theme. The item most frequently functioning as unmarked Theme in a declarative clause is the first
This is followed by the personal pronouns *you, we, he, she, it, they*; and the impersonal pronouns *it* and *there*.

A pattern where the Theme is something other than the Subject, in a declarative clause, is referred to as a MARKED THEME. The most usual form of marked Theme is an *adverbial group* (e.g. *today, suddenly*), or *prepositional phrase* (e.g. *in the morning, with confidence*), functioning as ADJUNCT in the clause. A COMPLEMENT, a nominal group, that is not functioning as Subject is also referred to as a marked theme (e.g. *nature in nature I loved, this responsibility in this responsibility we accept wholly*).

<table>
<thead>
<tr>
<th>Function</th>
<th>Class</th>
<th>Clause example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unmarked Theme</strong></td>
<td><strong>Subject</strong></td>
<td>Nominal group: Pronoun as Head</td>
</tr>
<tr>
<td></td>
<td>Subject</td>
<td>Nominal group: common or proper noun as Head</td>
</tr>
<tr>
<td></td>
<td>Subject</td>
<td>Nominal group: nominalization</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Marked Theme</strong></td>
<td><strong>Adjunct</strong></td>
<td>Adverbial group; prepositional phrase</td>
</tr>
<tr>
<td></td>
<td>Complement</td>
<td>nominal group; nominalization</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In Systemic Functional Linguistics, the Theme has three components:

1) **the Textual Theme** consists of the lexical elements that enable the connection between clauses and these elements are used to orientate or to structure the text (e.g. “in conclusion”, “and”, “that”). They almost always constitute the first part of the Theme, coming before any Interpersonal Theme. They provide thematic prominence to textual elements with a linking function.

2) **the Interpersonal Theme** includes elements that reflect the kind of interaction taking place among speakers (e.g. “maybe”, “obviously”); and

3) **the Topical Theme** contains a realization of the experiential representation - a participant, a process or a circumstance (e.g. “the car”). Each clause contains at least one Topical Theme.

The Theme extends from the beginning of the clause and includes any textual and / or interpersonal elements that may be present and the first experiential element, which could be a circumstance, process or participant.

Theme is defined in many ways by scholars. They come up with their own working definitions. Listed below are some of the working definitions of Theme. Halliday (1985) has his own parameters of theme. He views theme as

1. encoder – oriented
   
   “*What I, the speaker choose to take as my point of departure*

2. what “*gives the clause its character as a message*”

3. the element which serves as the point of departure of message.
His further assertions about theme are:

1. Themes take a speaker’s point of view rather than a hearer’s point of view.

2. Theme is a psychological notion, not just a packaging strategy.

3. Theme is essentially a clausal element represented by a single constituent.

These parameters and assertions distinguish theme from other related notions. First, theme is not the same as Given. Given is decoder-oriented, that is “what you, the listener or reader already know or have accessible to you” (Halliday, 1985: 278). Both Theme and Given are speaker-selected, that is, it is the speaker who assigns both structure, mapping one on to the other to give a composite structure to the discourse and thereby relate it to its environment.

Second, theme is not to be equated with subject. Subject is more intimately tied to the surface features of grammaticality while Theme is related to the concept of psychological subject (Rashidi, 1992:192).

Third, theme is not synonymous with topic in the usual grammatical sense in which that term is understood. According to Halliday, Topic cannot be understood in any universal sense as it has been used in many ways to mean many things. However, Topic shares some common aspects, that is:

i) *Topic operates at sentence level and not clause level.*

ii) *It is highly discourse – oriented.*

Halliday (1985: 35) implies that a language, if it has Theme - Rheme structures, signals Theme in some consistent overt manner (e.g. in English
sentence initial position, in Japanese, the particle – wa). If Theme is to be defined as “the point of departure of the message”, then Theme will be realized not only in different ways in different languages but also in different ways within a single language.

Danes (1964: 225) defines Theme as the element placed in the beginning of the sentence. According to him, Theme does not amount to known information but they do coincide. Danes’ biggest contribution is his work on Thematic progression. He looks at patterns in the text which show how Rheme becomes Theme in the following clause or how Theme is repeated in consequent clauses.

Mathesius (1975) defines Theme under two concepts: one, as “the starting point of the utterance, that which is known or at least obvious in the given situation, and from which the speaker proceeds”, and two, as “the foundation of the utterance, as “something that is being spoken about in the sentence.” Rheme will be “what the speaker says about, or in regard to the starting point of the utterance.” Theme, then is “something that can be gathered from the previous context, while Rheme expresses something new, something unknown from the previous context” (Firbas 1976: 11)

Theme plays a major part in the organization of the message. It enables the message to be communicated effectively and understood clearly. Halliday (1968:179) relates Theme with comprehension of a text and “its interpretation along predicted lines.” Simply, Theme can be thought as the idea represented by the constituent at the starting point of the clause. Halliday expresses this as ‘the point of departure of the message’. He sees the message being carried by
one clause. A clause begins with a realization of the Theme. The rest of the message is the realization of Rheme.

Halliday (1994) describes the theme – rheme dichotomy. First, the theme is marked in intonation as separate tone unit, frequently followed by a brief pause. Second, only the basic elements of the kernel structure can become the topic themes: the process (main verb), the participants (subject and object) and the circumstantial factors (adverbials). However, sometimes the sentence has more than one theme. In English, three possible themes are found: Textual themes (discourse markers and conjunctions) + Interpersonal theme (vocatives) + Topic theme (SVOA elements). The addresser uses theme and rheme to highlight a piece of information in the sentence. For example, it is quite common that “in spoken narrative and anecdotes, speakers will often front-place key orientational features for their listeners. These are most obviously time and place markers (“once upon a time”, “one day”, “then, suddenly”, “at the corner”, etc.), but may also be foregrounding of key participants and information about them felt to be important for the listener (Mc Carthy 1991:54).” Theme and Rheme are also used to organize the information in the text. Frequently, the rheme in one sentence becomes the theme in a following sentence. This phenomenon is called communicative dynamism.

Fries (1981) views theme as providing a framework for the interpretation of the clause. The theme orients the receiver to what is about to be communicated. He gives the following example:
1. They left their examination papers on the table yesterday.

2. Yesterday, they left their examination papers on the table.

In sentence 1, *yesterday* receives focal attention while in sentence 2 on *the table* receive focal attention. By the same token, in these sentences, *they* and *yesterday* serve an orienting function; they set up a context in which the remainder of the sentence is to be interpreted.

There is also a thematic organization of a topic of sentence. In English, the first sentence of a paragraph is also the theme of that paragraph (topic sentence), whereas the following sentences have a rhematic value (supporting sentences), which develop the idea proposed by the theme by means of examples, counter arguments, etc.

### 2.8 Overview of Thematic Progression

In functional grammar, a text may be organized in terms of Thematic progression. Thematic progression concerns the ways the texts develop the ideas they present. The selection of Theme for any individual clause will commonly relate to the way information is being developed over the course of the whole text. This progression of Themes over the course of a text is referred to as the text’s **method of development** (Fries, 1981). Danes (1974) claims that the organization of information in texts is determined by the progression in the ordering of utterance themes and their Rhemes.
Danes’s important contribution is the extension of the concept of theme as point of departure of a single utterance (sentence) to that of explaining the inner connexity of texts. He assumes that text connexity is represented, among other things, by thematic progression. By this, he means ‘the choice and ordering of utterance themes, their mutual concatenation and hierarchy as well as their relation to the hyperthemes of the superior text unit (such as paragraph, chapter, etc.), to the whole text, and to the situation. Thematic progression might be viewed as ‘the skeleton of the plot’ for Danes (1974: 114)

Danes (1974) identifies 4 main types of thematic progressions which may occur in a text. The basic principle underlying these patterns, is that Thematic choices should not be unexpected – they should be connected with ideas presented in a previous Theme or Rheme

The first type of thematic progression is Simple Linear Progression. In this sequence, the content of the Theme of a second sentence (Theme 2) derives from the content of the previous Rheme (Rheme 1); the content of Theme 3 derives from the content of Rheme 2. Figure 2.1 illustrates that. We (T1) is the Theme of the first clause and the rest Rheme. Part of the Rheme from clause 1 (framework) becomes the Theme of the second clause.

<table>
<thead>
<tr>
<th>We</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
</tr>
<tr>
<td>present a framework within which these tasks have a natural expression.</td>
</tr>
<tr>
<td>→R1</td>
</tr>
</tbody>
</table>
The second type is known as **Continuous or Constant Theme Progression**. This pattern keeps the same topical Theme in focus throughout a sequence of clauses. Information is built up in the Rheme of each clause. Figure 2.2 provides an example. We is the Theme for clause 1 and maintain its thematic positioning in clause 2.

<table>
<thead>
<tr>
<th>We</th>
<th>begin by discussing briefly cellular phone fraud detection as a domain to illustrate source of the issues in activity monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>→R1</td>
</tr>
</tbody>
</table>

**Figure 2.2:** Example of Constant Theme Progression

The third type of thematic progression is derived Theme progression. The passage text as a whole concerns a single general notion. The Themes of the various constituent clauses all derive from that general notion, but are not identical to one another. Figure 2.3 illustrates an example. All the subcategories...
of **rat like rodents**; *the black rat, voles, the house mouse, the field mouse* are derived Themes

<table>
<thead>
<tr>
<th><strong>The rat-like rodents</strong></th>
<th>include hamsters, lemmings, voles and gerbils, as well as rats and mice.</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>T1</em></td>
<td></td>
</tr>
<tr>
<td><strong>The black rat</strong></td>
<td>is found in buildings, sewers and rubbish yards, but has been largely replaced by the bigger, more aggressive, brown rat.</td>
</tr>
<tr>
<td><em>T2</em></td>
<td></td>
</tr>
<tr>
<td><strong>Voles</strong></td>
<td>are mouse-like rodents that live in the grasslands of Europe and Asia; water voles, or water rats, build complex tunnels along river banks.</td>
</tr>
<tr>
<td><em>T3</em></td>
<td></td>
</tr>
<tr>
<td><strong>The house mouse</strong></td>
<td>often lives inside buildings and is a serious pest because it eats food.</td>
</tr>
<tr>
<td><em>T4</em></td>
<td></td>
</tr>
<tr>
<td><strong>The field mouse</strong></td>
<td>on the other hand, very rarely comes near human dwellings.</td>
</tr>
<tr>
<td><em>T5</em></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 2.3: Example of Derived Theme Progression*

The three types may be employed in various combinations. combinations of Types 1 and 2 being particularly frequent. Certain combinations may constitute TP-types of a higher order, representing a formal frame for the employment of the basic types. ‘The most important of such frames is that of ‘a split Rheme’.
Split Rheme is often quoted as ‘Type 4’, but it is in fact a combination of Types 1 and 2. Figure 2.4 provides an example of Split Rheme Progression.

<table>
<thead>
<tr>
<th>All substances $T1$</th>
<th>are divided into two classes: <strong>elementary substance</strong> and <strong>compounds</strong> $\rightarrow R1$ ($= R1a &amp; R1b$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>An <strong>elementary</strong> substance $T2$ ($= R1a$)</td>
<td>is a substance which consists of atoms of only one kind $\rightarrow R2$</td>
</tr>
<tr>
<td>A <strong>compound</strong> $T3$ ($= R1b$)</td>
<td>is a substance which consists of atoms of two or more different kinds. $R4$</td>
</tr>
</tbody>
</table>

**Figure 2.4:** Example of Split Rheme Progression

These patterns reveal that the first sentence provides the starting point or foundation for the following sentences. Therefore it functions as the theme for the paragraph as a whole. Christensen (1967) refers to the initial sentence of a paragraph as the topic sentence, to which the following sentences are related either coordinatively or subordinatively. Coordinative relations correspond to parallel progressions, and subordinative relations to linear progressions.

Danes (1974: 121) goes on to insist that these three types are to be considered as abstract principles, models or constructs. The implementation or manifestation of these models in particular languages depends on the properties of the given language.
Danes also points out that languages have at their disposal special means for the purposes of TP, as for instance, *both...and; on the one hand....., on the other*, the distribution of which builds up a ‘network of orientation’ of the text. He remarks on signaling devices in technical texts, scientific or technical prose. He also illustrates possible ‘complicated’ utterances obtained by coordination, nominalizations and relative clauses.

2.9 Chapter Summary.

The perusal of the relevant texts and researches done in this area revealed that no study has been carried out for texts used in EST, particularly texts obtained from encyclopedia, using the SFL theoretical framework. Texts on science and technology found in encyclopedias may be written by writers who may not have the knowledge of scientific register. Past researches had found that scientific texts are predominantly characterized by Constant Theme pattern and Linear Theme pattern. Do the scientific texts found in encyclopedia exhibit such patterns? Hence, this study aims to explore the texts found in encyclopedia using two models of analysis from the SFL theoretical framework. The findings will determine the suitability of such texts in teaching EST because any chosen text must be able to introduce students to the register of science and technology. The next chapter will go into detail the framework used and the methods in which the research was carried out.
CHAPTER 3: THEORETICAL FRAMEWORK AND METHODOLOGY

3.0 Introduction

This chapter will present the theoretical framework used in the study. There are three parts to the analysis namely the chosen model for the analysis, the analysis of the System of Theme and Rheme and the analysis of the System of Thematic Progression. Section 3.1 will outline the developed integrated model; Section 3.2 the System of Theme and Rheme and Section 3.3 the System of Thematic Progression.
3.1. Models for Analysis

This study utilized two models from the Systemic Functional Linguistics framework. First, an integrated model, developed from the models of Theme and Rheme proposed by Halliday and Mathiesen (2004 itself based on Halliday 1994 & 1985) and validated by Bloor & Bloor (2004). This integrated model is used to identify the Themes in every clause of the texts. The nature of the study demanded the development of an integrated model. The proposed models by the above mentioned scholars were developed to identify the functional role of every element. However, since the focus of the study is in looking at the Thematic progression of the text, thus identifying the Theme of every clause is more pertinent than the need for identifying the function of every element in the clause. The developed integrated model serves the task at hand aptly. Table 3.1 shows how the integrated model was used.

Then, Danes (1974) model for the analysis of Thematic Progression is adopted to analyse the thematic progression of the texts. This model underlines four types of thematic progression (see Section 3.3) that can be utilized to see the cohesion and coherence of a text.
Table 3.1: Sample of the integrated model

<table>
<thead>
<tr>
<th>Coding</th>
<th>Textual Theme</th>
<th>Interpersonal Theme</th>
<th>Topical Theme</th>
<th>Rheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP1</td>
<td></td>
<td></td>
<td>Pollution ,</td>
<td>( ) contamination of the environment by man-made substances or energy that have adverse effects on living or non-living matter.</td>
</tr>
<tr>
<td>EP2</td>
<td></td>
<td></td>
<td>This contamination of air, water, or soil materials</td>
<td>interferes with human health, the quality of life, or the natural functioning of ecosystems.</td>
</tr>
<tr>
<td>EP3</td>
<td>In simple terms,</td>
<td></td>
<td>pollution ,</td>
<td>, can be seen as the wrong substance in the wrong place in the wrong quantities at the wrong time.</td>
</tr>
<tr>
<td>EP4</td>
<td></td>
<td></td>
<td>This</td>
<td>implies that harm is caused to the environment,</td>
</tr>
<tr>
<td>EP5</td>
<td>and if</td>
<td></td>
<td>the same substance</td>
<td>is present at levels too low to cause harm</td>
</tr>
</tbody>
</table>

*Keywords: E refers to Environment, P refers to pollution and numbers 1-5 refers to clause number*

The developed integrated model befits the investigation of Textual Theme, Interpersonal Theme, Marked Topical Theme, Unmarked Topical Theme and Rheme aptly. It also allows thematic patterning of the text to be viewed clearly, as illustrated in the table above. Every clause in the text is identified and coded as above, e.g. EP1, EP2, EP3….. Then, the Theme / Rheme is determined and
placed appropriately in the respective columns. Once this is done, the thematic progression patterns can be ascertained easily. The coding system is described in Section 3.4.2 of this chapter.

3.2 The System of Theme and Rheme

The System of Theme and Rheme is realized in a clause where the clause has two main constituents: a Theme (the first part of the clause) and a Rheme (the remaining part of the clause). The choices of Theme in an English clause contribute much to the communicative effect of the message. Three different types of elements of clause structure get to be the Theme. The three are briefly discussed below.

3.2.1 Topical Theme

The Topical Theme is a must in every clause and is the first constituent of a meaningful structure of a clause and always represents a Participant, Circumstance or Process. It is always realized by one of the following elements: *Subject (S), Predicator (P), Complement (C), or Circumstantial Adjunct (A)*. A typical pattern in declarative clauses is one in which the Theme is conflated with the Subject;

\[ \text{e.g. } \text{Water can erode sediment on slopes} \]
where water is both Subject and Theme. In Systemic Functional Linguistics, this mapping of Theme on the Subject is classified as Unmarked Theme. The first pronoun *I* is an Unmarked Theme most profoundly found in everyday conversations. Following this are personal pronouns *you, we, he, she, it, they*; and the impersonal pronouns *it* and *there*. Then, comes other nominal groups – those with common nouns or proper nouns as Head – and nominalizations.

Marked Theme is a Theme something other than the Subject in a declarative clause. The most usual form of Marked Theme is an adverbial group, (e.g. *today, suddenly, quickly, surprisingly*), or prepositional phrase, (e.g. *at night, with much anticipation,*) functioning as ADJUNCT in the clause.

* e.g. *On a global scale, air pollution represents the greatest problem of all*

### 3.2.2 Interpersonal Theme

The interpersonal Theme is any combination of;

(i) **vocative** – personal name or a term of affection used to address the listener. It may appear anywhere in a clause and is considered thematic if precedes the topical Theme

(ii) **modal** - expresses the speakers’ judgement regarding the relevance of the message. Table 3.2 sets out the principal types of Interpersonal Theme.
Table 3.2: Examples of Interpersonal Theme drawn from An Introduction to Functional Grammar (Halliday, 1994: 49)

<table>
<thead>
<tr>
<th>Type</th>
<th>Meaning</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 probability</td>
<td>how likely?</td>
<td>probably, possibly, certainly, perhaps, maybe</td>
</tr>
<tr>
<td>usuality</td>
<td>how often?</td>
<td>usually, sometimes, always, never, often, seldom</td>
</tr>
<tr>
<td>typicality</td>
<td>how typical?</td>
<td>occasionally, generally, regularly, for the most part</td>
</tr>
<tr>
<td>obviousness</td>
<td>how obvious?</td>
<td>of course, surely, obviously, clearly</td>
</tr>
<tr>
<td>11 opinion</td>
<td>I think</td>
<td>in my opinion, personally, to my mind</td>
</tr>
<tr>
<td>admission</td>
<td>I admit</td>
<td>Frankly, to be honest, to tell you the truth</td>
</tr>
<tr>
<td>Persuasion</td>
<td>I assure you</td>
<td>honestly, really, believe me, seriously</td>
</tr>
<tr>
<td>entreaty</td>
<td>I request you</td>
<td>please, kindly</td>
</tr>
<tr>
<td>presumption</td>
<td>I presume How desirable?</td>
<td>Evidently, apparently, no doubt, presumably</td>
</tr>
<tr>
<td>desirability</td>
<td>How desirable?</td>
<td>(un)fortunately, to my delight/distress, regrettably,</td>
</tr>
<tr>
<td>reservation</td>
<td>How reliable?</td>
<td>Hopefully</td>
</tr>
<tr>
<td>validation</td>
<td>How valid?</td>
<td>At first, tentatively, provisionally,</td>
</tr>
<tr>
<td>evaluation</td>
<td>How sensible?</td>
<td>Broadly speaking, in general, on the whole</td>
</tr>
<tr>
<td>prediction</td>
<td>How expected?</td>
<td>In principle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(un)wisely, understandably, mistakenly, foolishly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To my surprise, surprisingly, as expected, by chance</td>
</tr>
</tbody>
</table>

(iii) **mood-marking.**

a) A Finite verbal operator, if preceding the topical Theme, is the element that embodies the expression of polarity. It is this that expresses positive or negative: *is, isn’t; do, don’t; can, can’t*
b) A WH-interrogative (or imperative let’s) when it is not preceded by another experiential element (i.e. when functioning simultaneously as topical Theme)

3.2.3 Textual Theme

The textual Theme is any combination of:

i) continuative – a small set of discourse signalers, yes, no, well, oh, now which signal that a new move is beginning: a response, in dialogue, or a move to the next point if the same speaker is continuing.

ii) structural – any of the obligatory thematic elements listed in the Table 3.3 and Table 3.4 below, conjunctions and WH-relatives

Table 3.3: Conjunctions drawn from An Introduction to Functional Grammar, (Halliday 1994: 50)

<table>
<thead>
<tr>
<th>Type</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>co-ordinator</td>
<td>and, or, nor, either, but, yet, so, then</td>
</tr>
<tr>
<td>subordinator</td>
<td>when, while, before, after, until, because, if, although, unless, since, that, whether, ( in order) to</td>
</tr>
</tbody>
</table>
Table 3.4: Relatives drawn from An Introduction to Functional Grammar, (Halliday, 1994: .50)

<table>
<thead>
<tr>
<th>Type</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definite</td>
<td>Which, who, that, whose, when, where (why, how)</td>
</tr>
<tr>
<td>indefinite</td>
<td>Whatever, whichever, whoever, whenever, wherever, however</td>
</tr>
</tbody>
</table>

iii) conjunctive – any of elements listed in Table 20.Usually such an Adjunct precedes the Topical Theme.

Table 3.5: Conjunctive Adjuncts drawn from An Introduction to Functional Grammar, (Halliday, 1994: 49)

<table>
<thead>
<tr>
<th>Type</th>
<th>Meaning</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appositive</td>
<td>‘i.e., e.g.’</td>
<td>That is, in other words, for instance or rather, at least, to be precise</td>
</tr>
<tr>
<td>Corrective</td>
<td>‘rather’</td>
<td>in any case, anyway, leaving that aside briefly, to sum up, in conclusion</td>
</tr>
<tr>
<td>Dismissive</td>
<td>‘in any case’</td>
<td>actually, in fact, as a matter of fact</td>
</tr>
<tr>
<td>Summative</td>
<td>‘in short’</td>
<td></td>
</tr>
<tr>
<td>Verifactive</td>
<td>‘actually’</td>
<td></td>
</tr>
<tr>
<td>Additive</td>
<td>‘and’</td>
<td>Also, moreover, in addition, besides</td>
</tr>
<tr>
<td>Adversative</td>
<td>‘but’</td>
<td>On the other hand, however, conversely</td>
</tr>
<tr>
<td>Variative</td>
<td>‘instead’</td>
<td>Instead, alternatively</td>
</tr>
<tr>
<td>Temporal</td>
<td>‘then’</td>
<td>Meanwhile, before that, later on, next, soon, finally</td>
</tr>
<tr>
<td>Comparative</td>
<td>‘likewise’</td>
<td>likewise, in the same way</td>
</tr>
<tr>
<td>Casual</td>
<td>‘so’</td>
<td>therefore, for this reason, as a result, with this in mind</td>
</tr>
<tr>
<td>Conditional</td>
<td>‘(if…) then’</td>
<td>in that case, under the circumstances, otherwise</td>
</tr>
<tr>
<td>Concessive</td>
<td>‘yet’</td>
<td>nevertheless, despite that</td>
</tr>
<tr>
<td>Respective</td>
<td>‘as to that’</td>
<td>in this respect, as far as that’s concerned</td>
</tr>
</tbody>
</table>
3.2.4 Multiple Themes

As mentioned in Section 3.2.1, every clause must contain one and only one Topical Theme. But it is common for clauses to contain a sequence of Themes. One or several Textual Themes and/or Interpersonal Themes may occur before the obligatory topical Theme. Table 3.6 shows the components of multiple Themes.

Table 3.6: The components of Multiple Themes drawn from An Introduction to Functional Grammar (Halliday 1994:54)

<table>
<thead>
<tr>
<th>Metafunction</th>
<th>Component of Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Textual</td>
<td>Continuative; structural (conjunction or WH-relative); conjunctive (Adjunct)</td>
</tr>
<tr>
<td>interpersonal</td>
<td>Vocative; modal (Adjunct), finite (operator); WH-(interrogative)</td>
</tr>
<tr>
<td>experiential</td>
<td>Topical (participant, circumstance, process)</td>
</tr>
</tbody>
</table>

*Note: WH-(relative) or WH-(interrogative) is also a topical element.*

Thus, the element of the clause typically chosen as the Theme depends on the choice of Mood. Table 3.7 below summarizes the pattern.
### Table 3.7: Mood Type and Unmarked Theme selection drawn from An Introduction to Functional Grammar 3rd Edition. Halliday & Matthiessen (2004: 78).

<table>
<thead>
<tr>
<th>Mood of clause</th>
<th>Typical (‘unmarked’) Theme</th>
</tr>
</thead>
</table>
| **Declarative** | nominal group functioning as Subject  
* e.g. *She went to the market.* |
| **Interrogative:**  
yes / no | first word (finite operator) of verbal group, plus nominal group functioning as Subject  
* e.g. *Did you lock the car?* |
| **Interrogative:**  
WH - | nominal group, adverbial group or prepositional phrase functioning as interrogative (WH-) element  
* e.g. *i) Where did you get that from?  
ii) Which house do they live in?* |
| **imperative:**  
‘you’ | verbal group functioning as Predicator, plus preceding *don’t* if negative  
* e.g. *i) Keep quiet.  
ii) Don’t do that* |
| **imperative:**  
‘you and me’ | *let’s*, plus preceding *don’t* if negative  
* e.g. *i) Let’s go home now.  
ii) Don’t let’s quarrel about it* |
| **exclamative** | Nominal group or adverbial group functioning as exclamative (WH-) element  
* e.g. *i) what a fool that person is  
ii) how sweet she sounds* |
3.3 The System of Thematic Progression

The System of Thematic Progression refers to the relationship between each clause unit Theme and the rest of the text in order which determines the kinds of thematic progression patterns occur throughout the texts. Danes (1974) identifies four main Thematic Progressions that can occur in a text. The basic principle underlying these patterns is that Thematic choices should not be unexpected – they should be connected with ideas presented in a previous Theme or Rheme. In the subsequent sections, samples of texts from the data will be used to illustrate the various Thematic Progressions.

3.3.1 Constant Theme Progression

The first type is known as Continuous or Constant Theme Progression. This pattern keeps the same Topical Theme in focus throughout a sequence of clauses. Information is built up in the Rheme of each clause.

<table>
<thead>
<tr>
<th>Type 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 → R1</td>
</tr>
<tr>
<td>↓</td>
</tr>
<tr>
<td>T1 → R2</td>
</tr>
<tr>
<td>↓</td>
</tr>
<tr>
<td>T1 → R3</td>
</tr>
</tbody>
</table>

Figure 3.1: Constant Theme Progression
3.3.2 Simple Linear Progression

The second type of thematic progression is “simple linear progression”, considered by Danes (1974) as the most basic thematic progression. In this sequence, the content of the Theme of a second sentence (Theme 2) derives from the content of the previous Rheme (Rheme 1); the content of Theme 3 derives from the content of Rheme 2.

**Figure 3.3:** Simple Linear Progression
3.3.3 Derived Theme Progression

The third type of thematic progression is a progression with derived themes. The passage text as a whole concerns a single general notion. The Themes of the various constituent clauses all derive from that general notion, but are not identical to one another.

Type 3

\[ T_1 \rightarrow R_1 \rightarrow [T] \]

\[ T_2 \rightarrow R_2 \]

\[ T_3 \rightarrow R_3 \]

**Figure 3.4**: Example of Simple Linear Progression extracted from Text ER

**ER5** Larger drops tend to be flattened and broken into smaller drops by rapid fall through the air.

**ER6** The precipitation of smaller drops, called drizzle, often severely restricts visibility.

**Figure 3.5**: Derived Theme Progression
3.3.4 Split Rheme Progression

The three types discussed in Sections 3.3.1, 3.3.2 and 3.3.3 respectively may be used in various combinations, combinations of Types 1 and 2 being particularly frequent. Certain combinations may constitute TP-types of a higher order, representing a formal frame for the employment of the basic types. ‘The most important of such frames is that of a split Rheme. Split Rheme is often quoted as ‘Type 4’, but it is in fact a combination of Types 1 and 2. Here, the Rheme of a clause contains two ideas which are developed as Themes in subsequent clauses. Figure 3.8 illustrates this.

Figure 3.6: Example of Derived Theme Progression extracted from Text HDep

**HDep11** In psychiatry, two major forms of depressive disorders are recognized

**HDep12** In both, the predominant symptom is a disturbance in mood

**HDep13** One form, depressive disorder, is marked only by episodes of depression

**HDep14** The other form, manic (bipolar) depressive illness, is characterized by alternating depressed and manic episodes
Type 4

Clause 1 T1 + [R2 + R3]

Clause 2 T2 + R4

Clause 3 T3 + R5

**Figure 3.7:** Split Rheme Progression

---

**Clause 1** All substances are divided into two classes: elementary substances and compounds.

**R2**

**R3**

**Clause 2** An elementary substance is a substance which consists of atoms of only one kind.

**R4**

**Clause 3** A compound is a substance which consists of atoms of two or more different kinds...

---

**Figure 3.8:** Example of Split Rheme Progression
3.4 Methodology

This section will outline the research methodology of the study. It covers the description of data as well as the stages of the analysis.

3.4.1 Data description

A total of seven areas (as described in Section 1.5) are outlined in the EST syllabus for the purposes of teaching and learning (see Ministry of Education syllabus). They are:

1. Nature and Environment,
2. Technology and Communications,
3. Energy/Matter & Mass/Force & Motion,
4. Man and Living Organisms,
5. Natural resources and Industrial Processes,
6. The Universe/Astronomy/Aerospace, and

For the purpose of the current study, two areas are selected. They are:

a) Nature and Environment
b) Nutrition/Food/Health/Human Body

For each area, three texts are selected. Table 3.8 below shows the areas and their respective topics.
The texts were selected from the Microsoft® Encarta® Encyclopedia 2002. © 1993 – 2001 Microsoft Corporation. The Encyclopedia is one of the sources used to derive authentic texts for the teaching of EST. The use of authentic materials can motivate teachers and students and could increase the positive attitudes towards the EST subject. The rational for selecting three texts from two different areas is to compare and contrast the thematic patterns of texts within the broad area of science. The patterns formed in these six texts will display the cohesion of the texts which will be of benefit to the teachers and students in teaching and learning.

<table>
<thead>
<tr>
<th>Areas</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Environment Pollution</td>
</tr>
<tr>
<td>2</td>
<td>Environment Erosion</td>
</tr>
<tr>
<td>3</td>
<td>Nature Rain</td>
</tr>
<tr>
<td>4</td>
<td>Health Pain</td>
</tr>
<tr>
<td>5</td>
<td>Health Dreaming</td>
</tr>
<tr>
<td>6</td>
<td>Health Depression</td>
</tr>
</tbody>
</table>
### 3.4.2 Coding System

A coding system is developed to analyse the clauses systematically.

Table 3.9 below illustrates the system.

**Table 3.9: Coding of Clauses.**

<table>
<thead>
<tr>
<th>Name of Text</th>
<th>Code for Text</th>
<th>Code for Clause of Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text 1</td>
<td></td>
<td>EP</td>
</tr>
<tr>
<td>Environment (E) :</td>
<td></td>
<td>EP1.</td>
</tr>
<tr>
<td>Pollution (P)</td>
<td></td>
<td>Other clauses for Text 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP1,EP2 – EP42</td>
</tr>
<tr>
<td>Text 2</td>
<td></td>
<td>EE</td>
</tr>
<tr>
<td>Environment (E) :</td>
<td></td>
<td>EE1.</td>
</tr>
<tr>
<td>Erosion (E)</td>
<td></td>
<td>Other clauses for Text 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EE1,EE2 – EE41</td>
</tr>
<tr>
<td>Text 3</td>
<td></td>
<td>ER</td>
</tr>
<tr>
<td>Environment (E) :</td>
<td></td>
<td>ER1.</td>
</tr>
<tr>
<td>Rain (R)</td>
<td></td>
<td>Other clauses for Text 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ER1,ER2 – ER23</td>
</tr>
<tr>
<td>Text 4</td>
<td></td>
<td>HP</td>
</tr>
<tr>
<td>Health (H) :</td>
<td></td>
<td>HP1</td>
</tr>
<tr>
<td>Pain (P)</td>
<td></td>
<td>Other clauses for Text 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HP1, HP2 – HP25</td>
</tr>
<tr>
<td>Text 5</td>
<td></td>
<td>HDR</td>
</tr>
<tr>
<td>Health (H) :</td>
<td></td>
<td>HDR1</td>
</tr>
<tr>
<td>Dreaming (Dr)</td>
<td></td>
<td>Other clauses for Text 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HDR1, HDR2 – HDR25</td>
</tr>
<tr>
<td>Text 6</td>
<td></td>
<td>HDep</td>
</tr>
<tr>
<td>Health (H) :</td>
<td></td>
<td>HDep1</td>
</tr>
<tr>
<td>Depression (Dep)</td>
<td></td>
<td>Other clauses for Text 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HDep1, HDep2 – HDep25</td>
</tr>
</tbody>
</table>
The clauses of every text are labeled according to the Area, Topic and the number of clause. For example;

i) **Code: EP1**
   
   E refers to Environment (Area)
   
   P refers to Pollution (Topic)
   
   1 refers to Clause 1 of the text.

ii) **Code: EE10**
    
    E refers to Environment (Area)
    
    E refers to Erosion (Topic)
    
    20 refers to Clause 20 of the text.

iii) **Code: HP1**
    
    H refers to Health (Area)
    
    P refers to Pain (Topic)
    
    1 refers Clause 1 of the text.

iv) **Code: HP15**
    
    H refers to Health (Area)
    
    P refers to Pain (Topic)
    
    15 refers to Clause 15 of the text.
3.4.3 Stages of Analysis

The analysis involves three stages. They are:

Stage 1: Identifying the clauses.

The selected texts are scrutinized and the clauses located and coded.

Stage 2: Identifying the Textual metafunctions

Then, the boundary of Theme and Rheme for each clause is identified, and the Themes categorized into Theme types namely, Topical theme, Textual theme and Interpersonal theme. The Topical theme is also categorized in terms of marked and unmarked themes.

Stage 3: Identifying the Thematic Progression.

Then, the thematic progression of the text is determined since the focus of this study is to investigate the Thematic Progression in EST texts.

3.4.4 Sample of Analysis

A sample analysis is provided in Table 3.10 and Figure 3.9. Table 3.10 shows the Theme identification in Text EE (Appendix EE (i)) whereas Figure 3.9 shows the Thematic Progression for Text EE.
Table 3.10 Theme identification

*(extracted from Text EE)*

<table>
<thead>
<tr>
<th>Coding</th>
<th>Textual Theme</th>
<th>Interpersonal Theme</th>
<th>Topical Theme</th>
<th>Rheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE1</td>
<td>Erosion,</td>
<td></td>
<td>Erosion,</td>
<td>( ) removal of sediment, rock, and soil from the landscape, resulting in the formation of new land forms and the lowering of the land surface, a process known as denudation.</td>
</tr>
<tr>
<td></td>
<td>T1</td>
<td></td>
<td></td>
<td>R1</td>
</tr>
<tr>
<td>EE2</td>
<td>Erosion and weathering</td>
<td></td>
<td>are closely connected</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T1</td>
<td></td>
<td></td>
<td>R2</td>
</tr>
<tr>
<td>EE3</td>
<td>but</td>
<td>It</td>
<td>is important to distinguish between them.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>T2</td>
<td></td>
<td>R3</td>
</tr>
<tr>
<td>EE4</td>
<td>Weathering processes</td>
<td>must break down rock</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>T1</td>
<td></td>
<td></td>
<td>R4</td>
</tr>
<tr>
<td>EE5</td>
<td>before</td>
<td>water, ice, and wind</td>
<td>can erode the debris.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>T3</td>
<td></td>
<td>R5</td>
</tr>
<tr>
<td>EE6</td>
<td>During transportation</td>
<td>the sediment further erodes the landscape by battering and rubbing against the surfaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>T4</td>
<td></td>
<td>R6</td>
</tr>
<tr>
<td>EE7</td>
<td>over which</td>
<td>it</td>
<td>passes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>T4</td>
<td></td>
<td>R7</td>
</tr>
</tbody>
</table>

Table 3.10 is an example of how the integrated model detailed in Section 3.1 was actually used in the analysis. The coding system (described in Section 3.4.2) is indicated in the first column. The following columns show Textual Theme (see Section 3.2.3), Interpersonal Theme (see section 3.2.2) and Topical Theme (see Section 3.2.1)
The text above comprises forty one clauses. The initial seven clauses are selected to show the three stages of analysis. Table 3.10 illustrates Stages 1 and 2 where the clauses had been identified, coded and then the Theme identified. Figure 3.9 shows the Thematic patterning that prevails.

**Figure 3.9:** Thematic progression for Text EE

Note:
SLP – Simple Linear Progression
CTP – Constant Theme Progression
DT - Derived Theme Progression
SRP - Split Rheme Progression
3.5 Chapter Summary.

In conclusion, this study made use of two models from the Systemic Functional Linguistics framework for the analysis. The first model, an integrated model was used to identify the Themes in every clause of the text. This integrated model was developed from the models of Theme and Rheme proposed by Halliday and Mathiesen (1994) and validated by Bloor & Bloor (2004). The second model, Danes (1974) which underlines four types of Thematic Progression, was used for the analysis of Thematic Progression of the texts. The following chapter will provide the findings of the study.
CHAPTER 4: FINDINGS AND DISCUSSIONS

4.0 Introduction

This chapter will present the findings and discussions of the study on Thematic progression in upper secondary EST texts. The theoretical framework of Theme and Rheme proposed by Halliday (1994) and types of Thematic progression proposed by Danes (1974) will be used for the analysis. This chapter will be divided into four main sections; namely Section 4.1 on Types of Theme, Section 4.2 on Types of Thematic Progression, Section 4.3 on EST texts as messages and Section 4.3 on Discussion of Findings.
The research questions of the study are;

i) **What are the types of Themes found in EST texts?**

ii) **What are the types of Thematic progression found in EST texts?**

iii) **How are EST texts structured as messages from the perspective of Thematic progression?**

They will be answered in Sections 4.1, 4.2 and 4.3 respectively. Then Section 4.4 will provide a summary of the findings presented in those sections.

### 4.1. Results for Types of Theme Analysis

The findings here relate to the first stage of the analysis where research question 1 will be answered. A total of 187 clauses were examined. For every clause, the types of Theme namely Textual Theme, Interpersonal Theme and Topical Theme were determined. The findings show that all Theme types were found. The most number of Themes were Topical Theme (186 elements). From that total, 93% (174) were unmarked Topical Theme while the remaining 12 were marked Theme. The least number of Themes were Interpersonal Theme, 1.1% (only 2 Themes). Textual Theme amounted to 42.7 % (80 elements) of the overall Themes found in the text. Section 4.1.1 through 4.1.3 will present the different types of Themes found in the texts. Table 4.1 shows the overall distribution of the Themes.
### Table 4.1: Overall Distribution of Themes in the data.

<table>
<thead>
<tr>
<th>Text</th>
<th>Clauses</th>
<th>Textual Theme</th>
<th>Interpersonal Theme</th>
<th>Topical Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marked</td>
<td>Unmarked</td>
</tr>
<tr>
<td>EP</td>
<td>42</td>
<td>25</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>EE</td>
<td>41</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ER</td>
<td>23</td>
<td>6</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>HP</td>
<td>25</td>
<td>10</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>HDR</td>
<td>34</td>
<td>11</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>HDep</td>
<td>22</td>
<td>6</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>187</td>
<td>80</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td><strong>42.7</strong></td>
<td><strong>1.1</strong></td>
<td><strong>6.4</strong></td>
</tr>
</tbody>
</table>

#### 4.1.1 Textual Theme

The Textual Theme denotes any combination of continuatives, structural and conjunctives and always precedes the Topical Theme in a Multiple Theme structure. Texts EP (25 elements) and EE (22 elements) contain the most number of Textual Themes. The least number of Textual elements are in Texts ER (6 elements) and HDep (6 elements). Texts HP and HDR show 10 and 11 instances respectively where textual theme has been employed. A total of 80 Textual themes made up of structural and conjunctive Adjuncts were utilized in these 6 texts to enhance cohesion and coherence of the text. In other words,
42.7% of the 187 clauses contained Textual Theme. Table 4.2 shows examples of Textual Themes found in the data. The Textual Themes are underlined.

**Table 4.2  Examples of Textual Themes**

<table>
<thead>
<tr>
<th>No</th>
<th>Types of Textual Themes</th>
<th>Coding</th>
<th>Clause Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Conjunctive Adjuncts</td>
<td>EP3</td>
<td><em>In simple terms, pollution can be seen as the wrong substance in the wrong place in the wrong quantities at the wrong time.</em></td>
</tr>
<tr>
<td>2</td>
<td>Conjunctive Adjuncts</td>
<td>HDR5</td>
<td><em>Things are seen and heard rather than being subjected to thought.</em></td>
</tr>
<tr>
<td>3</td>
<td>Conjunctive Adjuncts</td>
<td>EE26</td>
<td><em>When rivers meet resistant rock, unique and distinctive features may develop.</em></td>
</tr>
<tr>
<td>4</td>
<td>Structural</td>
<td>HDep10</td>
<td><em>The disorder strikes men and women of all ages and from all part of society, but some studies indicate that women are more often afflicted.</em></td>
</tr>
<tr>
<td>5</td>
<td>Structural</td>
<td>EP20</td>
<td><em>This may result in the poisoning of aquatic organisms or the depletion of oxygen owing to excessive growth of organisms.</em></td>
</tr>
<tr>
<td>6</td>
<td>Structural</td>
<td>ER3</td>
<td><em>They range in size up to about 3mm in diameter, and their rate of fall increases up to 7.6m per sec with their size.</em></td>
</tr>
</tbody>
</table>
4.1.2 Interpersonal Theme

The Interpersonal Themes, which is any combination of vocative, modal or mood marking elements, are scarce in the data. Of the 187 clauses analyzed, only 2 (1.1 %) clauses contained this Theme; a clause each in Text HDr and HDep and both are identical. Figure 4.1 shows the two samples of interpersonal Themes which are modal Adjuncts denoting typicality. The Interpersonal Theme is underlined.

| i) HDr24 | Typically, a person has four or five periods of D-sleep during the night. |
| ii) HDep | Typically, sufferers lose all interest |

Figure 4.1: Examples of Interpersonal Themes

4.1.3 Topical theme

The element most used in the investigated texts is the Topical Theme. The Topical Theme contains an experiential element: a participant, a circumstance or a process Topical Themes which are divided into Unmarked Topical Theme and Marked Topical Theme. The Unmarked Topical Theme is identified when the Subject conflates as the Theme. The unmarked option for thematic choice in a declarative clause is a nominal group functioning as the Subject of the clause. The Marked Topical Theme, on the other hand, is
elements other than Subject such as adverbial groups or prepositional phrases functioning as Adjunct.

The selected texts show a total of 186 Topical Themes. Out of this, 12 are marked Themes (6.4 %) whereas 174 are unmarked Themes. The Marked Topical Themes can be found in all the texts except Text EE. The Unmarked Topical Themes are found in every clause with most being in Texts EP (41 elements) and EE (41 elements). Figure 4.2 shows examples of Unmarked (underlined) and Figure 4.3 shows the examples of marked (underlined) Topical Themes sourced from the data.

| i) EP29 Nuclear waste is a further modern environmental concern |
| ii) EE12 Rivers move sediment downstream as part of their load |
| iii) ER21 Air may also be lifted by being forced to rise over a land barrier |

**Figure 4.2:** Examples of Unmarked Topical Theme

The Topical Themes in Figure 4.2 are unmarked because the Subjects nuclear waste, rivers and air realizes the Themes respectively. However, in cases where an element other than Subject becomes Theme, as shown in Figure 4.3, a marked Theme is identified.
4.2 Results for Types of Thematic Progression.

The findings here relate to the second stage of the analysis which responds to research question 2. Thematic progression analysis is done for every text to determine the method of development. The method of development here refers to the development of the experiential element (Topical Theme). Halliday & Matthiessen (2004: 79) state that the Theme of the clause is always containing one, and only one experiential element that is either a participant, a circumstance or a process.

The findings show that Danes (1974) four patterns of thematic progression are prominent in the selected data. The examination of the six texts revealed the existence of Constant Theme Progression, Simple Linear Progression, Derived Theme Progression and Split Rheme Progression. In other words, all four patterns of Thematic Progression suggested by Danes were identified in the data.
4.2.1 Constant Theme Progression.

Constant Theme Progression relates to a patterning where the Theme of one clause is maintained, either in the same form or different form, in the following clause. In other words, successive sentences share the same Theme. A total of 52 Constant Theme Progression patterns were identified in the 187 clauses which work out to 27.8% of the clauses. The most number of Constant Theme Progression occurrence was in Texts EP (14 patterns) and EE (16 patterns) with the least being in Text HP (4 patterns). Below are samples of this pattern taken from the data.

(EP2) This contamination of air, water, or soil materials interferes with human health, the quality of life, or the natural functioning of ecosystems.

(EP3) In simple terms, pollution can be seen as the wrong substance in the wrong place in the wrong quantities at the wrong time.

(Extract from Text EP)

The thematic patterning of the above text which is Constant Theme Progression is shown in Figure 4.4

**Figure 4.4:** Constant Theme Progression from EP2 to EP3
The Unmarked Topical Theme of Clause EP2, *This contamination of air, water, or soil materials*, is maintained in the subsequent Clause EP3 as *pollution*. The word *pollution* in EP3 captures the intended meaning in EP2.

An example of a longer chain of Constant Theme Progression is shown in Figure 4.5 below.

(EP4) *This implies that harm is caused to the environment* (EP5) and if *the same substance* is present at levels too low to cause harm, (EP6) then it *can be considered as contamination*. (EP7) *Many substances that can be pollutants also occur naturally*, (EP8) in which case they *are not classified as pollution*.

(extract from text EP)

The thematic development of the above text is shown in Figure 4.5

<table>
<thead>
<tr>
<th>EP4</th>
<th>This implies that harm is caused to the environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP5</td>
<td>The same substance is present at levels too low...........</td>
</tr>
<tr>
<td>EP6</td>
<td>It can be considered as contamination.</td>
</tr>
<tr>
<td>EP7</td>
<td>Many substances that can be pollutants also occur.........</td>
</tr>
<tr>
<td>EP8</td>
<td>They are not classified as pollution.</td>
</tr>
</tbody>
</table>

**Figure 4.5**: Constant Theme Progression from EP4 to EP8
This in EP4 refers to pollutants and this unmarked Topical Theme is maintained from EP4 to EP8 in various forms. In EP5, pollutants are referred to as The same substance, in EP6 as It, in EP7 as Many substances and EP8 as They. A constant Theme pattern is observed.

4.2.2 Simple Linear Progression

Simple Linear Progression is a type of patterning where the Rheme portion of each clause becomes the Theme of the following sentence. There are 37 instances of SIMPLE LINEAR PROGRESSION in the examined 187 clauses. The most being in Texts ER (9 patterns) and HDr (10 patterns) and the least in Text EE (1 pattern). In total Simple Linear Progression constitutes of 19.8% of the considered 187 clauses. Figure 4.6 shows an example of Simple Linear Progression.

(EE20) As rivers become larger, (EE21) they are able to carry more sediment from the landscape (EE22) and the sediment becomes more denuded.

(extract from Text EE)

The simple linear thematic progression is shown in Figure 4.6
Figure 4.6: Simple Linear Progression from EE21 to EE22

A part of Rheme in EE21, more sediment becomes the Theme of the subsequent EE22 clause the sediment, forming a simple linear progression.

An example of a longer chain of Simple Linear Theme is witnessed in Figure 4.7

(HDr1) Dreaming, a form of mental activity, different from waking thought, that occurs during sleep. (HDr2) The nature of dream activity has been characterized by many clinical and laboratory studies. (HDr3) These studies show that dreams are more perceptual than conceptual: (extract from Text HDr)

The Simple Linear Progression of the extract above is shown in Figure 4.7
A part of the Rheme in HDr1, *a form of mental activity*, becomes the Theme in HDr2, *The nature of dream activity*. Subsequently, part of the Rheme in HDr2 *many clinical and laboratory studies* become the Theme of HDr3, *These studies*. This pattern shows the existence of Simple Linear Theme in this extract.

### 4.2.3 Derived Theme Progression.

Derived Theme Progression is a pattern where the topics of each clause are individually different, but are all derived from the same overriding theme, or overall theme of a paragraph or text. There were four instances of Derived Theme Progression in the data. Two are in Text EE and one each in Text HDR.
and HDep, which works out to only 2.1% of the 187 clauses. An instance of Derived Theme Progression is shown in Figure 4.8.

(HP10) Two types of nerve fibres carry this information from the nociceptors to the spinal cord: (HP11) A-delta fibres, which transmit information quickly and appear to be responsible for the acute sense of pain: (HP13) C-type fibres, which transmit impulses more slowly and, may cause nagging pain.

(extract from Text HP)

---

**Figure 4.8** Derived Theme Progression from HP10 to HP13

The Theme in HP10 denotes two types of nerve fibres which are explained separately in HP11, *A-delta fibres* and HP13, *C-type fibres*. The general Theme is looked in detail in the subsequent clauses with them clinching the Thematic position. Such occurrence indicates the emergence of Derived Theme patterning.
4.2.4 Split Rheme Progression

Split Rheme Progression is a case whereby the Rheme of a clause contains two ideas which are developed in subsequent clauses. The data exhibits only four instances of SRP; two in Text EP and one each in Texts ER and HP. That constitutes 2.1% of the 187 clauses.

(ER21) Air may also be lifted by being forced to rise over a land barrier (ER22) with the result that, the exposed windward slopes have enhanced amounts of rain (ER23) while the sheltered, or lee slopes have little rain

(extract from Text ER)

Figure 4.9: Split Rheme Progression from HP10 to HP13

Clause ER consists of a main idea in the Rheme, land barrier, which could be split into two Topical Themes, namely the exposed windward slopes (ER22) and the sheltered or lee slopes (ER23). This pattern testifies the existence of Split Rheme Progression.
Table 4.3 summarizes the overall distribution of Thematic progression found in the six chosen texts.

**Table 4.3: Overall Distribution of Thematic Progression**

<table>
<thead>
<tr>
<th>Texts used in the analysis</th>
<th>Total number of Clauses in the Text</th>
<th>Types of Thematic Progression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Constant Theme Progression</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Simple Linear Progression</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Derived Theme Progression</td>
</tr>
<tr>
<td></td>
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<td>Split Rheme Progression</td>
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<tr>
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<td></td>
<td></td>
<td>2.1</td>
</tr>
</tbody>
</table>

The findings in Table 4.3 clearly indicate that Constant Theme Progression is the most prominent in these six EST texts, totaling 27.8 % (52 instances). This is closely followed by Simple Linear Progression, 19.8 % (37 instances). The least number of occurrences is shared by Derived Theme Progression and Split Rheme Progression, 2.1 % (4 instances).
4.3 EST texts as messages

The findings here relate to research question three on how EST texts are structured as messages from the perspective of Thematic progression. Scientific texts are regarded as expository texts. In such texts, simple linear progression patterns predominate. Research done by Nwogu (1990) testified to this finding. This finding is further validated by Weissberg (1984) in his study of scientific writing. He found that Simple Linear Progression occurs more frequently than the Constant Theme Progression pattern. The findings for the above studies indicate that scientific texts exhibit Simple Linear Progression pattern at a higher percentage compared to the other patterns. Research Question 3 aims to see whether its findings concur with those of Nwogu (1990) and Weissberg’s (1984).

The findings of the current study clearly indicates that science texts found in Microsoft Encarta encyclopedia adhere to the register of science only to a certain extent due to the fact that Constant Theme Progression patterns outnumber Simple Linear Progression ones. Texts of scientific register ought to comprise of more Simple Linear Progression patterns compared to the other patterns. By using Simple Linear Progression, writers can ensure that the readers are constantly ‘with them’ in terms of points of departure. Thus, teachers of EST using this resource ought to do the necessary modifications to the texts so as to ensure they comply with the register of science because the main objective of EST is to expose students to the science register.
Sections 4.3.1 through 4.3.6 will analyse each text to see how the clauses relate to one another thematically to ensure the coherence of the text.

4.3.1 Analysis of Text EP

This particular text’s area is environment with the topic on pollution. This text provides an overview of pollution, types of pollution, and their effects. The text begins with the definition of pollution.

EP1  *Pollution, (is) contamination of the environment by man–made substances........*

Pollution is an unmarked topical THEME and RHEME begins with contamination whereas (is) is elliptical. The following clause EP2, relates to the RHEME of the preceding text. The RHEME of EP1 becomes the THEME of EP2, thus creating a *simple linear progression.*

EP1  *Pollution, (is) contamination of the environment by man–made substances........*

EP2  *This contamination of air, water, or soil materials interferes with human health.............*
In simple terms, pollution can be seen as the wrong substance in the wrong place in the wrong quantities at the wrong time.

Figure 4.10: Simple Linear Progression

EP3 sums the meaning of EP1 and EP2 with a Textual Theme (*in simple terms*) and reiterates the meaning of pollution. Here, Constant Theme Progression is witnessed. The RHEME of EP3 then becomes the THEME of EP4, through the use of the determiner *this*. A Linear Theme Progression can be seen here. Clauses EP4, EP5, EP6, EP7 and EP8 are linked by the same THEME (*substances*), Although the structures vary, yet they convey the same meaning, thus forming Constant Theme Progression. Figure 4.2 below shows the pattern of Constant Theme Progression.

EP4  *This implies that harm is caused to the environment*...

EP5  *the same substance is present* ...........

EP6  *it can be considered as contamination*

EP7  *Many substances that can be pollutants* ....
EP8 They are not classified as pollution

Figure 4.11: Constant Theme Progression


EP16 The most familiar forms of pollution result from the chemical properties of the substances concerned,

EP17 but the physical properties may also be important.....................

Figure 4.12: Simple Linear progression

The Themes for EP18, EP22 and EP23 are actually an extension of Rheme EP11
Pollution can be categorized according to the medium in which it occurs: atmospheric pollution, freshwater and sea pollution, or land pollution.

**Figure 4.13**: Split Rheme Progression.

Here, the third type of thematic development, **Split Rheme Progression** is identified. The theme in EP18 is reiterated in EP19 through the determiner *this*. The Theme air pollution in EP23 is constantly utilized in EP24, and EP25; thus forming **Constant Theme Progression**.

**Figure 4.14**: Constant Theme Progression
The **Split-Rheme Progression** resurfaces in EP27;

EP27 *On a global scale, air pollution probably represents the greatest problem of all,*

EP28 *with greenhouse gases (such as carbon dioxide) resulting in global warming*

EP29 *and synthetic chlorine compounds (chlorofluorocarbons) depleting the stratospheric ozone layer.*

**Figure 4.15:** Split-rheme progression

The unmarked Topical Themes of EP28 and EP29 are merely examples of air pollution mentioned in the Rheme of EP27.

After treating the types of pollution, the text moves to trends in pollution, and another related idea. Thus, **Trends in pollution** becomes the Theme for EP32 and is maintained until EP34, creating a **Constant Theme Progression** pattern.

**Figure 4.16:** Constant Theme Progression
The Theme in EP40 (the reductions in the developed world) is linked to the Rheme in EP34 (is a trend, for decreasing levels of pollutants in the developed world).

The text as a whole highlights the issue of pollution. The text is organized in a manner where the main idea pollution becomes the hypertheme. This hypertheme has four sub-ordinate themes; air pollution, water pollution, soil pollution and nuclear waste.

Every subordinate theme illustrates mainly Constant Theme Progression pattern where the main issue, pollution is mentioned in every clause. Reference is made to the main theme frequently, either through impersonal pronouns or nominal groups. Simple structures exhibit frequent use of unmarked topical themes whereas complex structures use multiple themes.

4.3.2 Analysis of Text EE

This text is about erosion. Generally, it defines erosion and explains the effects of erosion. Then, water (river) the main agent of erosion is introduced and how it erodes is explained. Due to the process of erosion, various landscapes
are formed. The text ends with the extent of damage done by human activities which accelerate erosion. The text exhibits Constant Theme Progression, mainly. Frequently, references are made to the hypertheme (erosion), either in the form of nominal groups or pronouns.

The first clause, EE1 defines erosion. Befittingly, the word Erosion becomes the topical unmarked Theme of the clause.

\[ EE1 \text{ Erosion, (is) removal of sediment, rock, and soil from the landscape, resulting in the formation of new land forms and the lowering of the land surface, a process known as denudation.} \]

This Theme (Erosion) is compared with Theme in EE4 (weathering processes). The comparison is done till EE5. Till then, a clear cut thematic development could not be ascertained. When the Rheme of EE5 (can erode the debris) becomes the Theme for EE6 (the sediment), Constant Theme Progression begins to develop until EE9

\[ EE5 \text{ before \ water, ice, and wind can erode the debris} \]
\[ EE6 \text{ During transportation, the sediment} \]
\[ EE7 \text{ over which, it} \]
\[ EE8 \text{ the fragments} \]
\[ EE9 \text{ (the fragments)} \]

**Figure 4.17**: Constant Theme Progression
EE10 indicates the beginning of waters/rivers as the agent of erosion. This is aptly indicated by putting Water in the thematic position. This position is maintained until EE12. EE13 digresses to a type of erosion (vertical erosion) but the Theme reverts to rivers in EE14 (downstream rivers).

Simple Linear Progression is evident in EE18 to EE19 and EE21 to EE22

**EE18**  During transport, *sediment helps aggrade the bed and banks,*  
**EE19**  and attrition of the particles  
causes them to be ......  

**EE21**  they are able to carry more sediment from the landscape,  
**EE22**  and the sediment becomes more denuded.  

**Figure 4.18**: Simple Linear Progression.

Another instant of Constant Theme Progression is found from EE28 to EE31

**EE28**  Rivers cut into valley floors and sides  
**EE29**  as they meander, reworking deposits laid down in earlier periods.  
**EE30**  Water can erode sediment on slopes  
**EE31**  where overland flow or runoff occurs.  

**Figure 4.19**: Constant Theme Progression.
Many new Themes are introduced as the text develops and these new Themes are linked to the main idea of erosion through the use of textual themes, mainly Conjunctive Adjuncts. Therefore, the text resembles a cohesive text.

4.3.3 Analysis of Text ER

The text defines rain first and looks at how rain is formed later. Although different themes are introduced, but they are related to the main theme, rain. Again, Constant Theme Progression pattern prevails.

ER1 Rain, (is) precipitation of liquid drops of water
ER2 Raindrops generally have a diameter greater than 0.5mm
ER3 They range in size up to about 3 mm in diameter
ER4 and their rate of fall
ER5 Larger drops

Figure 4.20: Constant Theme Progression

A linear theme pattern is seen between ER1 and ER2, whereby certain aspects of ER1 Rheme becomes the Theme of ER2. Subsequently, this Theme is maintained until ER5. Similar thematic pattern (Simple Linear Progression to Constant Theme Progression) could be seen from ER6 to ER7.
Larger drops tend to be flattened and broken into smaller drops by rapid fall through the air. The precipitation of smaller drops, called drizzle, often severely restricts visibility, but (it) usually does not produce significant accumulations of water.

Figure 4.21: Simple Linear Progression to Constant Theme Progression.

The Rheme of ER7 proceeds to form the Theme in ER8 and is maintained until ER10.

Amount or volume of rainfall is expressed as the depth of water ……….. and (it) is measured in a rain gauge to the nearest 0.25mm.

Rainfall is classified …………………………………

Figure 4.22: Simple Linear Progression to Constant Theme Progression

The idea is also further developed by the Simple Linear Progression pattern. The Rheme of the preceding clause becomes the Theme of the following clause.

An instant of Split Rheme pattern can be seen in ER21, ER22 and ER 23. The Rheme of ER21 contains an element (land barrier) which can be subdivided.
Air may also be lifted by being forced to rise over a land barrier with the result that, the exposed windward slopes have enhanced amounts of rain while the sheltered or lee slopes have little rain.

Figure 4.23: Split Rheme Pogression

4.3.4 Analysis of Text HP

This text defines pain and its relation to some areas of the brain. The first clause (HP1) defines pain. Aptly, the lexis pain becomes the Theme of the clause. The Rheme which begins with an elliptical is, progresses to become the Theme of the following clause, HP2.

HP1  Pain, (is) unpleasant sensory and emotional experience ……

HP2  This definition …

HP3  Thus, the definition……

Figure 4.24: Simple Linear Progression to Constant Theme Progression

This Theme is maintained in HP3. HP4 shifts to another new information but related to the main theme, pain. The Rheme of HP4 then becomes the Theme of HP5. Interestingly, the Theme of HP4 (Animals) skips one clause and becomes the Theme of HP6.
HP4 Animals exhibit behaviour that can be labeled pain, and such modes of behaviour have been studied.

HP5 But whether animals have the strong psychological

Figure 4.25: Simple Linear Progression and Constant Theme Progression

Figure 4.26: Constant Theme Progression

HP7 Pain is the single most common complaint for

HP8 Acute pain starts with the stimulation of one or more

HP10 presents Derived Theme Progression pattern.

HP11 Two types of nerve fibres carry this information from the nociceptors

HP13 A-delta fibres, which transmit information quickly C-type fibres, which transmit impulses more slowly

Figure 4.27: Derived Theme progression

The Theme introduces two types of nerve fibres in HP10 and explains them separately in HP11 (A-delta fibres) and HP13 (C-type fibres). Split –rHEME pattern is displayed by HP17 whereby some aspects of its Rheme (parts of the brain) become the Theme in HP18, HP19, HP21 and HP25.
The impulse then travels to several parts of the brain. Some brain areas determine where the pain is.... other (brain) areas integrate the sensory information .......
These same brain centres can activate long nerve fibres. Some areas of the brain that process pain messages secrete a related chemical....

Figure 4.28: Split Rheme Progression.

Generally, this text exhibits Constant Theme Progression pattern, Simple Linear Progression pattern, Split – Rheme Progression pattern and Derived Theme Progression pattern. There is no one dominant progression pattern in this text. Such diverse patterns may influence understanding of the text. Students will not be able to focus on the line of thoughts and it will soon discourage them from reading the text. This is the instance where a teacher has to modify the text so as to produce a text which has a constant pattern. Learners would be able to follow the development of ideas and this motivates them.
4.3.5 **Analysis of Text HDr**

This text defines dreaming, looks at possible dream triggering factors and the states of dreaming.

Clause HDr1 (the first clause) has a Topical unmarked Theme, Dreaming. The Rheme has elliptical is. The Rheme then becomes the Theme for HDr2, forming linear theme development.

**HDr1** *Dreaming, (is) a form of mental activity, different from waking thought...*

**HDr2** *The nature of dream activity has been characterized by many clinical and laboratory studies*

**HDr3** *These studies show that dreams are more perceptual than conceptual:*

**Figure 4.29:** Simple Linear Progression.

The idea of dream is further elaborated in HD9, HD10 and HD11 through linear theme progression.
Most dreams are in the form of interrupted stories, made up partly of memories, with frequent shifts of scenes.

This broad characterization includes a great variety of dream experiences.

Many dreams collected in sleep laboratories are rather ordinary.

Figure 4.30: Simple Linear Progression

Derived theme progression is prevalent in HDr19.

Thus, two clearly distinguishable states of sleep exist.

The first state, called S – synchronized sleep, or NREM-sleep.

The second type of sleep, known as D-sleep or REM-sleep.

Figure 4.31: Derived Theme Progression
Constant Theme Progression prevails from HDr28 to HDr31

**HDr28**  *Such stimuli as sounds and touches impinging on a dreamer* can be incorporated....

**HDr29**  *if they occur during a D-period.*

**HDr30**  *These stimuli*, however, *do not initiate a D-period*

**HDr31**  *if one is not already in progress*

**Figure 4.32:** Constant Theme Progression

**Simple Linear Progression** pattern predominates. The existence of Constant Theme Progression pattern and Derived Theme Progression pattern add variety to the text. Such progression brings forth one aspect of cohesion, reference, as an important tool to maintain the line of thought.

**4.3.6 Analysis of Text HDep**

This text defines depression and looks at the types of depression. HDep1, being the first clause, has given thematic prominence to the word Depression and Rheme defines it with an elliptical statement. HDep2 through the use of marked topical theme *(in contrast to normal sadness)* contrasts
normal sadness with clinical depression. The Theme of HDep3 (clinical depression) is similar to the Theme in HDep1. This Theme is maintained in HDep4 (elliptical it) and HDep5 (it).

Simple Linear Progression is displayed between HDep7, HDep8 and HDep9 and between HDep20, HDep21 and HDep22.

\[ HDep7 \text{ and } surveys \text{ suggest that 20 percent of people in the } United States \text{ suffer} \ldots. \]

\[ HDep8 \text{ with perhaps some 25 percent of the population suffering from a period of depression} \ldots. \]

\[ HDep9 \text{ The disorder strikes men and women of all ages} \ldots. \]

**Figure 4.33:** Simple Linear Progression

\[ HDep20 \text{ In the manic phase of bipolar illness, the patient’s mood can be elevated, expansive, or irritable} \]

\[ HDep21 \text{ Behaviour is bizarre and sometimes obnoxious.} \]

\[ HDep22 \text{ Other symptoms may include excessive talkativeness, thoughts that leap from one point or subject to another} \ldots. \]

**Figure 4.34:** Simple Linear Progression.

Clause HDep11 consists of a topical marked Theme and Rheme. The Rheme indicates two major forms of depressive disorders that can be split and treated separately. HDep12 looks at its symptoms together whereas HDep13 looks at
In psychiatry, two major forms of depressive disorders are recognized. In both, the predominant symptom is a disturbance in mood. One form, depressive disorder, is marked only by episodes of depression. The other form, manic (bipolar) depressive illness, is characterized by…….

Figure 4.35: Split Rheme Progression.

Simple Linear Progression pattern dominates the text with an instance of Split Rheme Progression pattern. The clauses in the text are thematically linked, thus producing a coherent text. Learners would be able to understand the text better due to constant thematic development of the content.
Table 4.4 illustrates the overall distribution of the types of Thematic progression found in every text.

Table 4.4: Thematic Progression Patterns in each text

<table>
<thead>
<tr>
<th>Texts</th>
<th>Patterns identified</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Constant Theme Progression</td>
</tr>
<tr>
<td>EP</td>
<td>⭐️</td>
</tr>
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</tr>
<tr>
<td>HDep</td>
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</tbody>
</table>

⭐️ : Indicates the presence of patterns

Table 4.4 shows the types of Thematic Progression patterns that prevail in every text. All the texts contain at least three types of patterns with Derived Theme progression and Split Rheme progression becoming an optional element. Texts EE, HDR and HDep consist of Constant Theme Progression, Simple Linear Progression and Derived Theme Progression whereas Texts EP, ER and HP contain Constant Theme Progression, Simple Linear Progression and Split Rheme Progression.
4.4 Findings and Discussions.

The findings of Sections 4.1, 4.2 and 4.3 will be presented and reflected upon the three major research questions reiterated below;

1) What are the types of Themes found in EST texts?
2) What are the types of Thematic progression found in EST texts?
3) How are EST texts structured as messages from the perspective of Thematic progression?

The investigation into thematic structure (Section 4.1) revealed that Topical Themes, in particular unmarked Themes were utilized the most in the data compared to Interpersonal Themes and Textual Themes. A total of 186 Topical Themes were found in the data which accounts to 99.4% of the total number of clauses analyzed. From this, 93% (174 elements) were unmarked Topical Themes and 6.4% (12 elements) were marked topical Themes. The least utilized are Interpersonal Themes amounting to only 1.1% (2 elements). This finding clearly indicates that Subjects which conflate as Theme (unmarked Theme) are the norm in the clauses structures found in scientific texts. Unmarked Themes provide the linking element that ties the clauses together so as to produce a cohesive text. Marked Theme is uncommon in scientific texts as displayed in this data. Interpersonal Themes are scarce in scientific texts. Textual Themes, on the other hand, play an important role of linking the clauses so as to produce a cohesive text. Textual Themes were found in every text, totaling up to 42.7% (80 elements). So, in order to produce a cohesive scientific text, unmarked Topical Themes and Textual Themes play a prominent role. This
finding may be of great significance to teachers. Teachers will practice more discretion in selecting texts for EST lessons so as to ensure the texts display the characteristics of scientific register. Besides that, they can also emphasize on these characteristics when teaching students to write in the register of science.

The investigation into Thematic progressions (see Section 4.2,) revealed that Danes’ four types of thematic progression were prevalent in the chosen data, which is a sample of a scientific text. However, their frequency of occurrence in every text was different. The type of Thematic progression with the highest frequency in all the texts is Constant Theme Progression. It amounts to 27.8 % (52 elements) of the data with the highest concentration in Texts EE (16 instances) and EP (14 instances). The other Texts display a much lower frequency; HP ( 4 elements ), HDep ( 5 elements ), ER ( 6 elements ) and HDR ( 7 elements ). Simple linear progressions are more dominant compared to derived theme progression and split rheme progression. Table 4.3 (page 15) clearly illustrates this.

The occurrence of such thematic patterning adds variety to the EST texts. However, a too frequent interplay of patterns is bound to affect students’ comprehension level, especially those from the low and average English proficiency level. So, teachers of EST need to scrutinize materials in terms of thematic progression in order to gauge the level of difficulty of the text. If there exists interplay of patterns, then they need to do the necessary modification. The modification should not at any moment compromise on the scientific
register of the text. A scientific text should consist of predominantly Simple Linear Progression and Constant Theme Progression. Thus, the modification of the text should comply with this prerequisite since the objective of the EST syllabus is to expose students to the register of science and to enable them to access content from such texts. When teachers ensure that a selected text has predominantly Simple Linear Progression pattern of development or Constant Theme Progression pattern, then students could be more focused and follow the development of ideas in the text easily, especially those from the lower proficiency level. Furthermore, Simple Linear progression and Constant Theme Progression ensures the text have cohesion and coherence. These two elements are of much importance in enabling the readers to follow the writer’s line of thought easily especially in a technical material like scientific texts.

The investigation into EST texts as messages from the perspective of Thematic progression (see Section 4.3) revealed that every text in the data contained at least three types of Thematic progression (see Table 4.4). Text EP highlights pollution in the environment. In trying to convey the message in detail, pollution is made the main Theme and air pollution, water pollution, soil erosion and nuclear waste becoming its sub-ordinate Themes. Themes are repeated or referred to consistently through impersonal pronouns or nominal groups. This intention leads to the formation of Constant Theme pattern. In other instances, Rhemes of clauses becomes the Themes of subsequent clauses, thus forming Simple Linear pattern. These two patterns are used extensively in this text. Their existence ensures the cohesiveness of the text and this criterion is of utmost importance in enabling readers to comprehend the
The same strategy is employed in Text EE which dwells on erosion in the environment. As the text develops, new but related unmarked Topical Themes are introduced. Textual Themes, mainly Conjunctive Adjuncts are also utilized. The presence of these Themes ensures the cohesion and coherence of the text.

Text ER looks at how rain is formed. This idea is conveyed to the reader in a systematic manner through the use of Constant Theme Progression pattern and Simple Linear Progression pattern.

Text HP which explains about pain displays all three patterns with none being a dominant pattern. This occurrence will to a certain extent influence the understanding of the text. When comprehension is affected, students are bound to view the text as very challenging and began to lose interest in the subject. These are the moments where teacher discretion is exercised. Either they reject such texts or modify the text so as to produce a text which has one dominant pattern in spite of the existence of other patterns.

Texts HDr, which discusses dreaming, has more Simple Linear progression patterns compared to Constant Theme Progression patterns. Certain aspects of the Rheme progresses to become the Theme of the subsequent clauses, thus creating a cohesive text. If the frequency of such occurrence is high, then it can be concluded that text is cohesive and enables the reader to follow the writer’s line of thought.
Text HDep deals with depression and it too employs Constant Theme pattern and Simple Linear pattern to bring across the message of depression. Here, both the patterns are equally distributed.

4.5 Chapter Summary

The choice of thematic pattern greatly influences the cohesion and coherence of a text. As for scientific texts, the intended message is distinctively conveyed through the use of Simple Linear Progression pattern and Constant Theme Progression pattern. The findings of the analysis chapter indicate that Constant Theme Progression pattern predominates in texts extracted from the encyclopedia. This finding qualifies the texts sourced from encyclopedia as a suitable text for exposing students to the register of science. The following chapter will conclude the study by providing the summary and the pedagogical implications of this study.
CHAPTER 5: CONCLUSION

5.0 Introduction

This chapter will serve as the concluding chapter for the study on an investigation into Thematic Progression in upper secondary EST texts from the perspective of Systemic Functional Linguistics. This chapter is divided into three sub-sections. Section 5.1 will provide the summary of the findings whereas Section 5.2 will consider the pedagogical implications and suggested classroom application of Thematic Progression. Section 5.3 will look at directions for further researches in this area.
5.1 Summary of Findings

This study was undertaken to examine how English for Science and Technology (EST) texts were structured as messages from the Theme-Rheme perspective, in particular from the Thematic Progression perspective. The findings of the investigation may to a certain extent help teachers to make EST lessons more interesting and meaningful as Halliday and Martin (1993: 124) claim “we need to understand how the language of these texts (scientific texts) are organized, in order for us to help our learners find the task of reading scientific texts less daunting.” Three research questions were formulated so as to serve as guiding thoughts in this investigation. They are: i) What are the types of Themes found in an EST texts? ii) What are the types of Thematic Progression found in EST texts?, and iii) How are EST texts structured as a message from the Thematic Progression perspective?.

The data for the study is from Microsoft Encarta Encyclopedia 2002, one of the many authentic sources used as a resource to gather reading texts for EST lessons in upper secondary classes. The six texts were based on scientific topics. Since the sample is from the register of science, then the findings of the study could be applied to all the texts used for EST lessons.

The study concludes that Unmarked Topical Themes and Textual Themes are extensively used in the selected data. Throughout the clauses in every text, these Themes relate to one another mainly through two methods of development: Constant Theme Progression and Simple Linear Progression. These two Thematic Progression patterns bring about the internal cohesion of the
texts. Although Derived Theme Progression and Split Rheme Progression are identified in the texts, they are not as prominent as the former two patterns. Their role could be seen in the overall organization of a text; for example, the issue on pollution in Text EP. Pollution functions as the hyper theme and with its subordinate themes being air pollution, water pollution and noise pollution. From the hypertheme, the subordinate themes are derived; a Derived Theme Progression pattern is exemplified.

The four patterns of development were distributed in combinations of three and four in one text but their frequencies differ. A scientific text exhibits Simple Linear Progression and Constant Theme progression at higher frequencies, as testified in the current study. Therefore, Thematic Progression patterns structure EST texts to befit the register of science.

5.2 Pedagogical Implications.

The knowledge of Thematic Progression can be used in the teaching of reading. Generally, in the teaching of reading, many teachers adopt bottom-up teaching methods, noticing that learners comprehend words and sentences. The reading way that the thematic progression can advocate is top-down. Learners first understand the whole content, and then they comprehend the relationship between sentences. In other words, they first identify the main idea (Theme) and then identify the secondary idea (Rheme) of the sentences and then comprehend the relationship of sentences (Thematic Progression). This skill is very important in reading, especially in fast reading. The Thematic
progression also benefits the development of the paragraph. The focus on how text is constructed can help learners become better readers. Teachers should teach their students to be sensitive to the language that writers use when they are presenting their ideas. This may enable students to become sensitive to the issues which are of primary concern to the writers. The placement of information in the clause and sentence constitutes such a signal, and sensitizing the students to patterns in the placement of information will help them better in interpreting texts.

EST lessons, as any language lesson, focuses on the importance of textual cohesion and coherence in writing. Francis (1990) says that teaching students about Themes explicitly will result in the improvement of coherence in their writing. The manipulation of unmarked and marked Thematic choices and the Thematic patterns are means through which writers achieve textual cohesion and coherence and can realize evaluative comment. By engaging the students in critical reading of scientific texts, then applying the same analysis to their own, students can see for themselves where their writing might be lacking organization and, more importantly, where their text shows signs of organization and development.

In terms of activities to teach Themes to students, it is suggested that students can be presented with lists of several thematic choices realizing the same basic proposition and discussing differences in meaning or message. Students could be asked to find which variety of Thematic choices provides the answers. They could discuss the best choice as Theme for a sentence to follow a given stretch of text. Also, to get practice in progression strategies, they could be
asked to supply the preceding sentence or text for a given extract. With students of low proficiency, some concepts of specific items that need more attention are Multiple Themes, Marked Topical Themes as well as Derived Theme Progression and any progression other than constant and linear progression. As Hawes and Thomas (1997) point out:

‘While every effort is put in teaching students to get away from simplistic Themes and developing longer Themes and promoting the use of certain choices, it is necessary that students understand the principles behind any text analysis, that is, not to employ too much of any given variables, but rather, to choose the combination that best suits the writer’s rhetorical purpose.’

5.3 Classroom Applications

The principle of integration can help teachers cover a cluster of skills in several lessons. Once a topic is selected, teachers can plan tasks and activities that seek to integrate skills. In all of these lessons, moral values should be infused. This can be done through the appropriate selection of materials or through discussions that seek to emphasize that science and technology should be employed for the betterment of mankind. Discussion around controversial topics such as cloning or genetically modified foods can serve to make students aware of implications.

Language skills, vocabulary, and grammar items must be repeated often to maximize learning and bring about retention. To this end, teachers should set a variety of tasks and activities that will enable learners to use the language items repeatedly so that items are reinforced. Repetition should be carried out using new materials to avoid boredom.
In order to bring about effective learning, learners must be given every opportunity to engage in real or simulated activities that require them to use the language i.e. lessons should be activity-based and learner-centred and revolve around real-life tasks to ensure relevance.

Although the syllabus encourages the use of authentic material for reading, these may prove too difficult for weaker students. Teachers are constantly encouraged to modify and adapt these materials to a level suited to the language proficiency of their students so that they are not deterred from the outset. Teachers should ensure modifications do not compromise the structures used in the science register. In order to satisfy that requirement, teachers may well benefit from the knowledge of Theme – Rheme and Thematic Progression as this directly relates to the structure of the texts.

**5.4 Further research.**

This type of analysis can also be carried out in spoken genres such as lectures, conversations, story telling and jokes. It can also be applied to the comparison of professional scientific writings. Other authentic sources like newspaper reports, magazines or science or technology pamphlets could also be analysed for the cohesion of text using this approach. The focus will be to explore whether there is any connection between perceived coherence and thematic progression.
5.5 Chapter Summary

This chapter has provided a conclusion on how English for Science and Technology texts were structured as messages from the Theme – Rheme and Thematic Progression perspective. It has also given some insights in pedagogical implications of the study. The claims made in this dissertation are subject to verification by those involved in this field. The views that complement and contradict these claims will only enrich this investigation.
BIBLIOGRAPHY


