

Linguistics Metafunctions of Academically Historical Engineering Text and Its Implications towards the Teaching of Reading in ESP Context

Rita Darmayanti

Politeknik Negeri Malang

email: rita.darmayanti@polinema.ac.id

ABSTRACT

This paper aims at exploring the linguistics characteristics of historical text in an academically engineering textbook by investigating the linguistics metafunctions of the text based on Systemic Functional Linguistics theory. Investigating the textualization of historical text to achieve its roles and purposes for presenting and recounting events in the past requires critical analysis of the use of lexico-grammatical and discourse-semantic linguistics resources by identifying the textual, interpersonal, and ideational functions of the text. The findings showed that historical text belongs to the genre of recount and is structured by (1) the constant and continuous thematic progression to point out the remarkable events happened in the past, (2) declarative clauses having positive polarity and validity for the past time, (3) the predominance of material clauses showing the emphasizing on recounting the action done by engineers in the past. This study suggests teacher to provide explicit assistance for students to understand the meaning and function of the elements constructing the nominal group which textualizes the lexical density of the text and the clause complexes in terms of clauses' dependency relation based on their meaning, context, and function.

Keywords: historical text, Systemic Functional Linguistic, language metafunctions

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INTRODUCTION

Each text type utilizes specific linguistic resources to construct meanings and textualize its role and function. Understanding text requires understanding the linguistic features that characterize the genre of the text so that different text type gives different demands and challenges for the readers. According to (Coffin, 2004) and (Martin J. R., 2002), history genres are classified based on its taxonomy into four main categories comprising recounts, accounts, descriptions, and explanations in which different types requires different ways in presenting events or facts and explanations operate within each genre. Achugar & Schleppegrell (2005) points out that understanding historical text demands readers to know the functions of a wide variety of linguistic resources, from the

way the text is structured to the use of particular conjunctions or causal verbs; or even understanding what is implied but not explicitly stated and established connections between distant events and construct logical relationships that may not be highlighted in the text. Thus, utilizing historical text for teaching reading requires promoting linguistic awareness needed by the students to understand the text successfully.

In the context of ESP, the teaching of disciplinary literacies in tertiary ESP settings in the era of internationalization of education is arguably an important, if not essential, component of the target performance competence in tertiary ESP settings (Zhang & Chan, 2017). Systemic functional linguistics (SFL) has made a significant contribution towards the development of research that analyze and identify the specific language features of specialized texts covering the grammatical and textual patterns characterizing genres in different disciplines. Traditionally, ESP focusses on the language features covering lexis and register, skills, discourse and genres (Dudley-Evans, 1998) but the recent development of ESP demands for challenges in teaching disciplinary or academic literacies to promote students' knowledge since English has a role as an international language and the internationalisation of education. Thus, this study concerns exploring historical engineering text, which is classified as a disciplinary text using Systemic functional linguistics (SFL) theory and perspective.

The context of this research is teaching ESP for engineering students, particularly in Digital Technology Network and Telecommunication Engineering study programs at the State Polytechnic of Malang, Indonesia. English is a compulsory, taught from the first to sixth semesters in all engineering departments. In each semester, English is allocated for 1 to 2 *sks* (semester credit units) or 2 hours per week with approximately 23 to 30 students in each class. The teaching of English at the Digital Technology Network and Telecommunication Engineering for the first-year students focus on the teaching of reading and is mainly designed to expand students' ability to understand references written in English and develop students' professional skills as well as their professional attitudes. The primary resource of authentic materials used for the teaching of reading in this course is taken from a book entitled Introduction to Engineering, which is designed and written for the first-year engineering students in an English-speaking country. The topics cover the introduction to the world of engineering, history of engineering: engineering in the early civilizations, notably the Mesopotamians and the Egyptians, and definition and branches of engineering. The teaching of reading itself covers the strategies to activate students'

background knowledge comprising content and linguistic background knowledge to facilitate students in comprehending reading materials and expanding students' knowledge and understanding of the structure of the text.

English Practitioners at the Digital Technology Network and Telecommunication Engineering have developed exercises to activate students' linguistics background knowledge by studying sentence structure by means of dividing sentences into phrases comprising their subject, predicate – to replace the term finite – and explanation including noun group functioning as the object of the sentence and prepositional phrase. It is considered useful for the students to have explicit knowledge of function and meaning of the subject and finite since these might raise the difficulty for them in understanding basic sentence structure, the meaning of the sentence, and the structure of text. The students' problems in sentence comprehension are assumed as the result of their lack of understanding in the basic structure of sentence and the difficulties in identifying of meaning, function, and structure of clause and group in reading text—particularly nominal group and verbal group – as reflected in the quiz on sentence comprehension and reading comprehension earn out at the middle and the end of semester in the academic year of 2019/2020.

However, the exercises used in teaching and learning processes are not yet completely designed. In addition, the texts used for teaching reading have not been analyzed in detail in terms of their hierarchic structure covering the structure of groups and phrases, structural pattern of text, and relationship between parts of the texts. Therefore, text analysis must be carried out not only to analyze the structural pattern of clauses in the text but also to interpret and explain the pattern of language in each rank comprising word, group, phrase, and clause. Furthermore, in practice, explanation, and exercises on sentence comprehension covering the structure of clauses and groups are needed to be discussed in class. However, to do so, the result of text analysis must be projected to contribute to the revision and improvement of the teaching materials of English.

Text in Introduction to Engineering can be categorized as a kind of literate text which is aimed to introduce the concept and the related science of engineering. For students having basic proficiency in English, reading literate text, is projected as challenging to be understood. The characteristics of text which lead to difficulties encountered by the students, namely lexical density (the density of information resulted from the tightness of the content words in sentences) and ambiguity in terms of the syntactic structure and

unique expressions related to grammar (Halliday M., 1993). In addition, nominalization, which is a grammatical process that enables the writer to compact a great deal of information into one noun phrase (Celce-Murcia, 2001), potentially causes reading difficulties. Texts in Introduction to Engineering might share some of these characteristics because they are actually written for the first-year engineering students (native speakers) and are appropriate for the intermediate and advanced foreign language learner so that the characteristics possessed by these texts potentially cause difficulties to novice learners. Thus, these texts can be categorized as challenging texts for engineering students. On the other hand, language patterns are rarely become the focus of the attention of students and teachers since, commonly, their attention is on the content of the texts being read, not on how language interprets and constructs that content (Schleppegrell, 2004). In fact, rhetorical awareness of the texts and text purposes, as well as linguistic knowledge, provide readers with more 'cognitive control' in their comprehension process (Abdoallahzadeh, 2009)

To overcome problems that might be caused by the language structure of the text, seeking the most appropriate approach for analyzing text is needed. The notional or functional approach at its best is a very fruitful method of bringing together lexical items that co-occur naturally in describing the notion of the structure of language (Dudley Evans, 2001). Thus, one of the tools which are appropriate to be used for analyzing linguistic pattern and the structure of language and text aimed at seeking ways to help students in comprehending reading text is in the of light of the functional model of grammar which is commonly known as systemic functional linguistics (SFL). Functional grammar facilitates us to analyze any passage and relate it to its context, and also to the general background of the text: who it is written for, what is its angle on the subject matter, and grammatical analysis is a technical exercise and not something that students can be expected to undertake for themselves unless they are specializing in language (Halliday M., 1993). Therefore, functional text analysis can enlighten pedagogical practice and enable teachers to explicitly explore and explain how meanings are made.

LITERATURE REVIEW

Throughout the history, the ideas of language have been varied. From traditional grammar, we inherit the concept of part of speech, active and passive voice, tense, subject and object (Bloor & Bloor, 1995) Some American structuralists linguists, namely Sapir,

Bloomfield, and Chomsky, provide linguistics basis for practice drills and audio-lingual method which are strong in the field of phonology, morphology, and syntax. Still, they had little to say about semantics and the social aspects of language. By referring to the notion of traditional and structural grammar, as a result, it raises issues on the teaching of the language pattern commonly referred to as the teaching of grammar, which is generally assumed as teaching about language.

Furthermore, the most severe and confusing of these myths on teaching about language are those who would suggest that we can dissociate language from meaning – form from function, or form from 'content' which leads to the teaching about language which is generally defined as a matter of teaching language rules or particularly grammatical rules in the level of part of speech and sentence in isolation or free from the context which gives learners limited kinds of knowledge about the building of meaning through language (Martin & Rose, 2005). On the other hand, the teaching procedures of ESP are linked to a view of language and learning and all ESP activity has to be linked to a view of text so that an ability to use the certain key of grammatical features is vital in ESP work and that other grammatical features of little relevance to ESP work can be ignored (Dudley Evans, 2001). Thus, teachers of the ESP program need to have a deep understanding of the linguistic structure of text that they teach for helping students to have a better understanding of the way how the language is used in developing texts. Based on the reasons mentioned above, it is be concluded that functional grammar is an appropriate tool for analyzing texts to help to engineer students to comprehend reading both at the sentential level and in discourse-level to meet the students' needs in reading text and learning English.

In SFL, there are for main theoretical claims about language in systemic approach namely that language is functional; that its function is to make meanings; that these meanings are influenced by the social and cultural context in which they are exchanged; and that the process of using language is a semiotic process, a process of making meanings by choosing (Eggins, 1997). The features of the social context that grammar helps to represent include what is talked about (field), the relationship between the speaker/hearer/reader (tenor), and expectations for how particular text type should be organized (Schleppegrell, 2004). Grammar is the central processing unit of language, the powerhouse where meanings are created; naturally, the systems of sound and of writing through which these meanings are expressed should reflect the structural arrangement of the grammar (Halliday & Matthiessen, 2004). In SFL, the clause is the central resource for making meanings, and

the logical functions enable us to produce more complex configurations in which two or more clauses are joined into a larger whole (Thompson, 2004). Three aspects are reflecting the three main functions, namely ideational, interpersonal, and textual. These three functions always exist in each sentence. Ideational function refers to the use of language to represent experience, and it is influenced by the field. The sub functions of ideational function comprise the experiential, which is concerned with content and ideas, and the logical, which is concerned with the relationship between ideas. Next, the interpersonal function refers to the use of language to enact social relationships, and it is influenced by the tenor. The textual function also enables people to construct and organize text, which is relevant to its context, and it is influenced by mode.

Language reflects our view of the world consisting of going-on (verbs) involving things (nouns), which may have attributes (adjectives) and which go on against background details of place, time, manner, etc. (adverbials) (Thompson, 2004). Experiential function deals with the activities and the participants in the activities being described in the text. The content of clauses is mainly located in the processes which consist of participants in certain circumstances. Interpersonal function concerns with the use of language to exchange meanings in communication and that language evolves to serve the functions that we need because grammar provides us with the fundamental resource for expressing speech functions, in the form of a highly generalized set of clause systems referred to as MOOD (Halliday & Matthiessen, 2004). Therefore, a clause consists of Mood and Residue, which further classified into subject, complement, finite, predicator, and adjunct.

Textual function deals with the structure and organization of message in language used by the speaker and how the thematic organization contributes to the cohesive development of text (Halliday & Matthiessen, 2004). A clause consists of a Theme and Rheme. Theme is the point of departure for the message and conveys the background knowledge of the text that is put in the initial position. Rheme functions to present the context or topic presented by Theme so that it is places after the Theme of the sentence. In clause complexes (or sentence), which consist of a number of clauses linked together paratactically or hypotactically, the structure of Theme is analysed per sentence. Moreover, the structure of Theme in text is determined by the different functions and roles that it holds in developing and contributing to the organization of text within the context provided by Rheme.

The three main classes of group building a sentence comprise nominal group, verbal group, and adverbial group which are further combined to form constructed on the basis of logical relation. In analyzing clause complex (sentence), we study how clauses are linked to one another by means of some logico-semantic relation (how the words and phrases used to establish the relationship between ideas, issues, and event in a text) and focus on the various method of combining clauses together in English. The two basic types of relationship which function in different ways namely expansion and projection while, in terms of logico-dependency relation, the same interdependency is called parataxis (equal status) and the different one is called hypotaxis (unequal status) (Halliday & Matthiessen, 2004). In expansion, one clause expands on the meaning of another in various ways. In contrast, in projection, one clause projects another in the sense that it indicates that the other clause is a 'second-order' use of language, which means what is said in the projected clause has already been said somewhere else (Thompson, 2004).

Functional linguists have developed genre-based pedagogy in which the teaching and learning cycle is mainly concerned with both reading and writing. Genre-based pedagogy refers to the teaching of language based on the result of genre analysis, which studies language in relation to its context and meaning. Genre analysis is a tool to examine the structural organization of texts by identifying the moves and strategies, and to understand how these moves are organised in order to achieve the communicative purpose of the text (Osman, 2007). Many works of literature on genre-based approaches related to the teaching of reading focus on the identification of the rhetorical structure of texts (or the general rules which are used in organizing and structuring texts) within specific genres and on the realization of grammatical function in the text that has made way for a more balanced, integrated and dynamic interrelationship between bottom-up (grammatical) and top-down (rhetorical) approaches (Melissourgou & Frantzi, 2017). Many studies concerning reading come to the conclusion that sentence comprehension is a requirement of reading comprehension because sentence complexity can create comprehension problems for struggling readers (Afful, 2007). In a case for the sentence in reading comprehension, the contribution of sentence comprehension to successful reading emphasizes on general comprehension strategies at the text level (Scott, 2009). Thus, awareness of the rhetorical text structure helps improve the overall comprehension of text both in L1 and L2 reading (Sadeghi, 2007).

For sentence comprehension, it is needed to raise students formal or textual schema and linguistics schema, which are related to the structure of the text. An awareness of the macro-structure of text on the one hand and textual features such as theme and transitivity, on the other hand, can make reading more illuminating (Afful, 2007). However, research shows that specific school subject areas have their distinctive grammatical features and language structures that students must exchange between and across to be successful learners thus Bringing these resources of studying text provides a powerful tool for teachers and students to be used in comprehending and composing texts within contexts in wide range social and composing texts in wide range social and cultural contexts (Feng, 2013). Students do not necessarily need to know the theoretical principals of register theory. However, the students should be aware that languages' meaning can change from one situation to another, and that the language they use needs to be suitable for the audience, and the medium of communication.

Furthermore, students need to differentiate between spoken and written language, how that the written language needs to be more specific than spoken since it is the sole form of an explanation of the communicators meaning, there are no visual clues for example or props to assist in meaning (Eggins, 1997). Finally, raising underachievers students' awareness of text structures and writer strategies in producing such textual patterns can enhance their achievement in reading and writing (Abdoallahzadeh, 2009). Thus, raising student's awareness of text structure and clause structure is essential. To do so, teachers need to analyze the structure of text holistically before setting the aims of the course and designing the course syllabus and teaching materials.

METHOD

Since this study is aimed at giving a contribution to the project of developing teaching material for Digital Technology Network and Telecommunication Engineering students at State Polytechnic of Malang, therefore describe how the text is structured, the qualitative approach is used in this study rather than the quantitative approach. Thus, from this perspective, content analysis as one of the qualitative research types was used to facilitate the analysis of words of the text and gives better understanding from the perspective of the producer of the words. Content analysis will involve the specific and essential content characteristics of texts in Introduction to Engineering and the application of explicit rules based on functional grammar for identifying and, next, recording these

characteristics. In this content analysis, the researcher is the key instrument for analyzing and collecting the data. It is believed that the result of analysis using qualitative approach could better fulfill the needs of ESP since it is not isolated from context and this will give a comprehensive description of language as a means of communication covering its meaning, purpose, function in an academic context and indicates varieties on how language items and structures relate to each other in creating the communicative value.

Following the content analysis principle of data, the data of this present study are in the form of word, group, and clauses obtained from chapter one of the third edition of *Introduction to Engineering* book which examines the roots of engineering and traces its development to the present day under the chapter of the history of engineering and its development from the early civilizations to twentieth century (Wright, 2011). Texts under the one chapter are believed to share similar characteristics of text structure so that this study picks a passage entitled *Engineering in the Early Civilization: The Egyptians* as the data since it has a historical genre and presents a combination between recounts and cause and effect paragraphs.

At the first stage of this study, groups, phrases, and clauses complexes were analyzed in terms of their structures and functions covering the experiential function (the use of language to represent experiences), interpersonal functions (language used to enact social relationships), and textual functions (language used to construct logical and coherent texts). In analyzing groups, phrases, and clause complexes, the first focus is on studying how groups, phrases, and clauses are structured and linked to one another. The next focus is on the various methods of combining clauses and how they are used to establish the relationship between ideas, issues, and events in a text. The second stage of this study is focused on how the functional text analysis can be further projected to contribute to the initial step of developing material for the teaching of English by seeking ways on how to facilitate students both in sentence comprehension and reading comprehension. Also, the result of the text analysis will be beneficial for teachers in activating the students' linguistic background knowledge and, hence, improving the syllabus and revising the teaching material of English.

FINDING AND DISCUSSION

As a kind of academic discourse, the historical text in the *Introduction to Engineering* is characterized by a typical of literate texts which describe and discuss topics

related to the field of engineering, the 'tenor' or the relationship between the addresser (the writer) and addressee (the first-year engineering students as the intended reader of these texts), and the 'mode' because they are taken from the textbook. Structurally, this history of engineering in the early civilization: the Egyptians, as implied by its title, aims at describing the history of engineering within the specific era of the Egyptian civilization. The macro organization of this text provides explanations and descriptions about the history of engineering comprising the happening and engineering achievement in that era.

This text has some features characterizing the genre of recount as indicated by (1) the prominence of unmarked topical themes, (2) the typical structure of the zig-zag pattern with a combination of continuous progression for the text's thematic progression, (3) the text's structure comprising remarkable events stages and setting, description, problem, events, effect, and reaction phases, (4) the positive polarity of the entire declarative clauses showing the writer's positive attitude towards the Egyptians engineers and their engineering achievements, (5) the inscribed proposition inscribed in this text which is valid for the past time in the ancient Egyptians civilization as shown by the Finite of the clause, and (6) the predominance of material processes apart from the relational and mental processes indicating the certain emphasizing on the action done by the engineers of ancient Egypt. In the following section, the further detail discussion on the findings of functional text analysis of the Egyptians is presented.

The Textual Function of the Academically Historical Text

In terms of its textual function, the message or information of this text is organized in such a way to fulfill its aim as it belongs to the genre of recount presenting the recounting events in the past, particularly within the context of the ancient Egyptians civilization. From the result of the analysis, the theme choices of this text show the dominant usage of topical and unmarked themes by employing the participant serving as the subject of the clause as the themes. The dominant unmarked themes employed in this text indicate the writer's tendency to address the topic as the clauses' point of departure in all clause simplexes and clause complexes except clause 1.1 and 2.3. Furthermore, the usage of marked theme, on the other hand, indicates an emphasis on the frame for the contextual interpretation of the clause. In terms of stages and phases, it is shown that this text is developed through four stages of remarkable events in which, in each stage, there are some phases comprising setting, description, problem, events, effect, and reaction. The summary

of the theme analysis is presented below. Note: marked themes are in bold and textual themes are in italic).

Table 1. Stages, Phases, and Themes of the Historical Text

Clause	Stage/Phase	Theme	Rheme
1.1	Orientation/ Setting	In the ancient Egyptian civilization	expert in planning and construction emerged.
1.2	Remarkable events/ Description	These engineering forerunners	held top positions <i>as the trusted advisors of the Egyptian kings</i> .
1.3	Remarkable events/ Description	The man who held this position	was a general construction expert who was known as the king's "chief of works"
2.1	Remarkable events/ Event	These ancient engineers or architects	practiced the earliest known form of surveying, developed effective irrigation systems and built remarkable edifices of stone.
2.2	Remarkable events/ Problem	The annual flooding of the Nile	created a need for reestablishing land boundaries.
2.3	Remarkable events/ Reaction	To perform these surveys	Egyptian engineers used sections of rope that had been soaked <i>in water</i> , dried and then coated <i>with a wax material to insure constant length</i> .
2.4	Remarkable events/ Description	They	may have also used primitive surveying instruments, but none has been found.
3.1a	Remarkable events/ Event	It	is known <i>as early as 3300 B.C.</i>
3.1b	Remarkable events/ Event	<i>that</i> the Egyptians	developed and maintained an extensive system of dykes, canals, and drainage systems.
3.2a	Remarkable events/ Event	A great mass of people	populated the narrow fertile valley of the Nile
3.2b	Remarkable events/ Effect	<i>and</i> irrigations work	were needed <i>to maintain the large population and exploit the skill of agriculture</i> .
3.3a	Remarkable events/ Effect	The river	also served <i>as the principal means of transportation</i>
3.3b	Remarkable events/ Problem	<i>because</i> horses, wheeled vehicles, and roads	were unknown <i>in Egypt until about 1785 B.C.</i>
4.1a	Remarkable events /	The engineers of ancient Egypt	sought to build the tallest, broadest, and most durable structures

	Reaction		
4.1b	Remarkable events/ Comment	the world	would ever see
4.2	Comment/ Description	Their palaces, temples, and tombs	were designed <i>as symbols of triumphant and everlasting power</i>

The dominant usage of unmarked theme in the text employs the majority of topical Themes which are realized through brief Nominal groups, typically referring to specific people – e.g. the Egyptians engineer – and entities – e.g. The annual flooding of the Nile, a great mass of people, irrigations work – whereas the marked Themes are structured by topical Themes containing simple circumstantial expression – e.g., in the ancient Egyptian civilization, to perform these surveys. In addition, in terms of the development method of Theme which contributes to building the coherency and cohesion of the text, the Themes in this text are typically structured in the zig-zag pattern (simple linear progression) representing constant theme with the combination of continuous progress (constant theme). This particular pattern introduces an element or specific information in the Rheme, but this Rheme is promoted to be the Theme of the following clause. The pattern of the thematic organization of the first paragraph is diagrammed in figure 4.1 as an illustration of the zig-zag pattern. This typical pattern achieves cohesion in the text by building on newly introduced information, and it gives the text a sense of cumulative development, which may be absent in the repeated Theme pattern (Eggins, 1997).

Furthermore, according to Rose, 2006:2, the themes develop the organization of the text which is divided into some stages-predictable segments into genre-and phases-variable segments within each stage– representing the hierarchy of periodicity of the message in the text. At the same time, phases illustrate the wave of information consisting of one or more messages and variable segments, which afterward realize the generic stage of the text. The text is structured to point out events that happened in the ancient Egyptians civilizations as it is strongly framed in the marked theme of the first clause.

Figure 1. An Instance of Thematic Progression of the Historical Text

Clause 1	Theme <i>In the ancient Egyptian civilization</i>	Rheme <i>expert in planning and construction emerged.</i>
Clause 2	Theme <i>These engineering forerunners</i>	Rheme <i>held top positions as the trusted advisors of the Egyptian kings.</i>
Clause 3	Theme <i>The man who held this position</i>	Rheme <i>was a general construction expert who was known as the king's "chief of works"</i>

This text is opened by clause in the ancient Egyptian civilization, expert in planning and construction emerged serving as macroTheme since it contains the marked main point of departure of the text message – in the ancient Egyptian civilization – and main given information – expert in planning and construction emerged. It should be noted that the marked theme of the first clause introduces the contextual framework of time for interpretation not only for this clause but also for the first remarkable events' stage in paragraph one. Thus, this clause represents that the orientation stage begins with the setting which is expected to be followed by probable range of descriptions. Furthermore, the next clause points out the event describing the rheme of the first clause by referring experts in planning and construction to these engineering forerunners serving as the theme of the second clause. This unmarked theme aims at evoking imagery of the engineering forerunners presented in the first clause so that the phase of this clause is categorized as a description. Next, the third clause has the same aim as the second clause that is projecting the unmarked theme of the previous clause by referring to the man who held this position.

Furthermore, analyzing stages and phases enable the unfolding of ideation of clauses – the interpretation of sequences activity in text. In this text, the changing stages are indicated by the sequence's activity in each paragraph. The orientation stage in the first paragraph aimed at describing and defining the Egyptian engineers is moved to the next stage representing remarkable events in paragraph two. The unmarked theme in clause 2.1, these ancient engineers or architects, directly addresses the topic of remarkable event

emphasizing introducing succeeding events from the first paragraph. The Rheme of the event provides new information related to the advance action done by the Egyptians engineers which is further described in more detail by the addition of problem phase indicated by the theme of clause 2.2, the annual flooding of the Nile, and the reaction phase carrying behavioural or attitudinal outcome done by the Egyptians engineers which is underlined by the marked theme in clause 2.3, to perform these surveys and, afterward, described in further description in clause 2.4 which point out They (the Egyptians engineers) as theme. Thus, the problem in clause 2.2 counters the positive expectancy of reaction done by the Egyptian engineers, as shown by clause 2.3.

The next clause in 3.1 consists of sub-clause, in clause 3.1a, and the main clause in clause 3.1b. The Rheme of sub-clause carries new information concerning time, indicating the further ideation – a sequence of events or activity – in the text. The main clause, in addition, directs given information, the Egyptians, focusing on the main event which succeeds in time as carried by the Rheme of the clause. Furthermore, the Rheme of clause 3.1b is further projected in the subsequent clauses in a series of remarkable events. The unmarked of clause 3.2 presents another event aimed as the additional event to enhance the previous event in clause 3.1b and to create tension for the next clause in 3.2b since it serves as the event causing the need for developing and maintaining the irrigation work which is presented in the theme and rheme of the 3.2b clause. In addition, clause 3.3 carries effect and problem phases by serving the river as the point of departure of the main message. The textual theme in clause 3.3b is realized by the usage of conjunction to represent the problem describes the reason why the theme of 3.3a – the river – served as the most important means of transportation in Egypt before 1785B.C.

The next sequence of remarkable action is presented in the fourth paragraph carrying various phases that comprise event, writer's comment, and description of the engineering achievement made by the Egyptians. The first clause of this paragraph focuses on presenting the following event from the previous paragraph. The unmarked theme of clause 4.1a – the engineers of ancient Egypt – provides information that, in this paragraph, the description of remarkable events is focused on Egyptian engineers as the main topic. In contrast, the rheme of this clause gives new information related to the Egyptians' engineering achievement in terms of building structures. In this particular stage of remarkable events, the writer asserts his/her comment, which concerns with the structures built by the Egyptians engineers and proves that those structures would be the tallest,

broadest, and most durable structures that the world would ever see. In the last clause, the description of the aim of building construction is given. The interaction between event, comment, and description phases illustrate how event which is described in the succeeding phase can be commented by the reader to reflect his/her thought towards the event.

In summary, in this text, the first paragraph employs the elaboration phases, which presents context (setting) indicated by the marked themes and elaborating context (description) indicated by unmarked themes. Next, the second paragraph enhances the text by pointing out the event, the counter expectant by creating tension through a problem, the expectant by highlighting the behavioral reaction of the Egyptians engineers and marking circumstantial Theme which shows purpose, and the elaboration of context in the description presented in the last clause. The next enhancement of the text is carried out by the third stage of a remarkable event in paragraph three. It is developed by the usage of temporal events, which are strongly marked by the Rheme of the first clause, the material expectant of effects, and the problem. Furthermore, the last remarkable event employs a series of phases combining behavioral reaction of the Egyptians engineers, the writer's comment, and elaboration in context. Thus, the structure of themes representing the organization of phases and stages in the text implies that messages in the text are structured in such a way to fulfill its aim as it belongs to the genre of recount aimed at recounting events in the Egyptian civilization.

The Interpersonal Function of the Academically Historical Text

The discussion in this section concerns with how the writer interacts with the intended reader of the text – the first-year engineering students – which is realized through the structure of Mood and Residue comprising the subject, finite, predicator, complement and adjunct. In terms of Mood, all the clauses in this text are construed in declarative Mood which has a speech role as statements related to the engineering in the early civilization particularly the Egyptians. Furthermore, the declarative Moods in all clauses have positive polarity. On the other hand, the Subjects of the clauses are dominantly in the form of NGs (nominal groups). Furthermore, some of the subjects in the clauses are in the form of pronoun and empty noun, but these refer to the proceeding NGs. In addition, the writer never presents himself as participant by referring to I or the writer so forth unless he put the clauses into passive voice. In terms of Finite in text A, the Finite clauses are dominantly in the simple past tense and one clause in the past perfect tense. In addition,

three clauses are in the present tense comprising simple present tense and present perfect continuous tense.

Table 4.2 Mood Choices in The Historical Text

Clause	Mood	Speech Role	Subject	Finite
1.1	DEC	statement	expert in planning and construction (NG)	<i>past</i> (emerged)
1.2	DEC	statement	These engineering forerunners (NG)	<i>past</i> (held)
1.3	DEC	statement	The man who held this position (NG)	<i>past</i> : was
2.1	DEC	statement	These ancient engineers or architects (NG)	<i>past</i> (practiced, developed, built)
2.2	DEC	statement	The annual flooding of the Nile (NG)	<i>past</i> (created)
2.3a	DEC	statement	Egyptian engineers (NG)	<i>past</i> (used)
2.3b	DEC	statement	that (<i>Empty Noun</i>)	<i>past</i> : had been
2.4a	DEC	statement	They (<i>Pronoun</i>)	<i>present</i> : may have
2.4b	DEC	statement	none (<i>Pronoun</i>)	<i>present</i> : has been
3.1a	DEC	statement	It (<i>Pronoun</i>)	<i>present</i> : is
3.1b	DEC	statement	the Egyptians (NG)	<i>past</i> (developed and maintained)
3.2a	DEC	statement	A great mass of people (NG)	<i>past</i> (populated)
3.2b	DEC	statement	irrigations works (NG)	<i>past</i> : were
3.3a	DEC	statement	The river (NG)	<i>past</i> (served)
3.3b	DEC	statement	horses, wheeled vehicles, and roads (NG)	<i>past</i> : were
3.4a	DEC	statement	The engineers of ancient Egypt (NG)	<i>past</i> (sought)
3.4b	DEC	statement	the world (NG)	<i>past</i> : would
3.5	DEC	statement	Their palaces, temples, and tombs (NG)	<i>past</i> : were

From the result of the analysis, it is shown that all of the clauses are construed in the positive polarity of declarative Mood, which has a role as statement presenting the recount event depicting the engineering achievement of the ancient Egyptians. By

employing declarative clauses, the writer presents certain claims or new propositions related to the subject in which their validity is realized through the Finite of each clause. Furthermore, the positive polarity of all declarative clauses represents the writer's positive attitude toward the facts, events, and messages described in the text. Therefore, the declarative clauses having positive polarity indicate that the Egyptians text as it belongs to the genre of recount aimed at telling what happened in a sequence of events, and it gives positive evaluation towards the significance of the Egyptians engineering achievements in some ways.

The Subjects of the clauses, as the primary element of Mood, are dominantly in the form of complex Nominal Groups (henceforth NG), which mainly employ the elements of Deictic, Epithet, Classifier, and Thing. These typical Nominal Groups might raise the difficulty for readers having a low level of English mastery. The NGs in the first paragraph refer to the same particular entity – the Egyptians engineers – by quoting to them as *experts in planning and construction, these engineering forerunners, the man who held this position, and these ancient engineers or architects*. Hence, the NGs used are in the form of extended nominal groups, but, on the other hand, the writer expects the readers to be able to identify the referent of each NGs. In short, the first paragraph functioning as the MacroTheme of the entire text introduces an entity (*the Egyptians engineers*) as the Subjects which remain the same in the entire paragraph since that particular entity serves as the central subject. In addition, Subjects in both paragraphs one and three occupy nominal groups utilizing noun as Head and Deictic, Epithet and Classifier as Modifier. These typical extended NGs provide the referents of Subjects explicitly for the readers. Other types of elements realized the Subjects are appeared to be used in the second paragraph.

In this paragraph, the clauses start from the description of *These ancient engineers or architects* which is referred to the particular Subjects in the first paragraph. This subject serves as the topic of the main idea of the second paragraph since it is followed by several propositions of events describing the Egyptians engineers and what they have developed in terms of engineering achievement in the setting of Egyptian civilization. However, the employment of empty noun (that) in clause 2.3b indicates the zero anaphora which is lighter to be expected by the readers than the usage of pronouns since *that* specifies the referent clearly and places the Residue as the new claim describing further about section ropes used by the Egyptian engineers. Furthermore, the usage of third-person personal pronouns, *they*, in clause 2.4, points out that this subject's meaning is derived from the

context. In contrast, the impersonal singular pronoun, *none*, in clause 2.4, as a subject, is used to formulate a general statement about the claim made in this particular clause. However, from the usage of these pronouns, the writer shows that he/she has an attempt to disambiguate the reference through the developed context so that the reader can expect that *they* refer to the Egyptian engineers. In contrast, *none* refers to none of the surveying instruments. Thus, it can be concluded that the principal function of personal pronouns is to help establish significant referents in the discourse by setting up referential (identity) chains by means of anaphora as a device of cohesion since it is an integral part of referential coherence and chain (Downing and Lock, 2006: 415).

The finite clauses are dominantly in the simple past tense and one clause in the past perfect tense. In addition, three clauses are in the present tense comprising simple present tense and present perfect continuous tense. The predominance of past tense indicates that the text construes the facts happened in the past and that the validity of those particular facts, statements, and claims are merely true in the context of past time or ancient Egyptians civilization as the point reference. On the other hand, the employed past perfect continuous tense points out that particular fact is related to a state or events in relevance time, as in clause 2.3. In that clause, the usage of past perfect shows that the events of soaking water, drying, and coating sections of rope is relevant for and related to the previous clause – *to perform these surveys, Egyptian engineers used sections of rope*. However, the time relation of clause 2.3 is unambiguous, although it is not accompanied by time Adjunct since the context helps to establish the reference of the temporal link between events to be tracked by the readers. In short, the usage of the past perfect tense is aimed at referring to a previous event in the past. On the other hand, the employed present perfect tense as in clause 2.4b provides the contextual frame for the interpretation of the fact presented in the clause that occurs at the indefinite or unspecified time. Still, it is related to an appropriate time, in ancient Egyptians civilization, and is extended up to now. Thus, the dominant employment of past tense and additional past perfect tense in this text represents the text's characteristics as it belongs to the genre of recount aimed at describing or recounting events in the past.

Furthermore, in terms of the Residue, which comprises predicators, complements and adjuncts, the majority of the Predicators of the text have functions both as the Finite and the predicator itself since the Finite is implicitly attached in the predicator. The correspondence instances emerge, *held, practiced, developed, built, created, used, developed*,

maintained, populated, served, and sought. On the other hand, there are some predicators functioning as secondary tense and specifying the voice whether active or passive namely in *had been soaked, dried, and coated (passive), may have used (active), has been found (passive), were needed (passive), were unknown (passive), would see (active) and were designed (passive).* The voice of clauses indicates the emphasis of the clause. Active clauses indicate that the emphasis is on the subject or doer, while the passive clauses give emphasis to the action reflected by the predicator. In addition, the result of the analysis shows the dominance usage of circumstantial adjunct providing information related to the manner, role, purpose, time, and location, which is described further in the next section on experiential function.

The Experiential Function of the Academically Historical Text

The term experiential function means the function of the clause as a representation of processes undertaken in human experience, which is realized through the structure of transitivity – processes, participants, and circumstances. The transitivity structures of clause express representational meaning: what the clause is about, which is typically some processes, with associated participants and circumstances (Halliday & Matthiessen, 2004). From the result of the analysis, obviously, the text employs material processes (66 %) as the most dominant process apart from the further relational processes (13%) and mental processes (21%). The dominant usage of material processes indicate that Text A construes the world more in terms of action with ancient engineers or architects at its center since they hold a position as the Actor who fulfilled the actions pointed in the process. Thus, it can be expected from the analysis that the central participant type in Text A is Actor. The most dominant Actors in text A are to the Egyptian engineers as indicated by the reference of Actor as these engineering forerunners, these ancient engineers or architects, they, the Egyptians, and the engineers of ancient Egypt, which are all identified as the Egyptians engineers. However, the Actors, in several clauses, do not accompany by Goal as the secondary participant as in clause 2.1 and 2.4 since those clause give emphasize on the doer and the process itself, and the message in each clause is assumed to be completely understood although the goal is absence.

In addition, in the passive material clause as in clause 3.2b, and 4.2, the absence of employment of Actors emerges. Nevertheless, the implied actors are easily traceable because they are referred to as the previous clauses. In clause 3.2b, the Actor can be traced back by referring to the previous clauses, which indicate that the irrigation works were needed by the Egyptians to maintain the large population (a great mass of people) and

exploit the Egyptians' skill of agriculture. Furthermore, a similar passive without Actor can be found in clause 4.2. It is immediately clear that the Egyptians' engineers were the ones who ultimately responsible for designing the palaces, temples, and tombs. To summarize, passives in Text A are without Actors because they are self-evident, and the writer has expected them to be identifiable through the previous clause.

On the other hand, there are two identifying relational processes, as in clause 1.1 and 1.3. The identifying process of clause 1.1, *emerged*, employs Expert in planning and construction as Token with the absence of Value, which is left unidentified. This indicates that the writer focuses on the identification of the existence of an expert in planning and construction in the specific setting (in the ancient Egyptian civilization). In addition, the identifying process in clause 1.3 employs both Token and Value, particularly to describe "the man who held this position" objectively and identifiable by not attaching subjective attribute to the Token since the Value carries factual information about the position held by the Egyptians engineers that were a general construction expert who was known as the king's "chief of works."

Another type of process employed in this text is mental clauses encoding the meaning of thinking and feeling. The first class of mental processes employed in this text is cognition, which represents thinking, knowing, and understanding, for example, in clause 2.4b, 3.1, and 3.3. Second is perception comprising verbs of seeing and hearing, for example, in clause 3.2 and 4.1. In clause 2.4b, *but none has been found*, the mental process is represented by a verbal group – *has been found* – indicating the sense of knowing and understanding of the Phenomenon – *none*. The absence *Senser* of clause 2.4b appears anaphorically since the context of this clause describes that none of the primitive surveying instruments which may be used by the Egyptians has been found by the historians who study the Egyptians civilization serving as the implied *Senser* of this clause. In addition, clause 3.3 possesses an implied *Senser*, and it gives emphasizes on the mental process as indicated by the passive voice of the clause. The Phenomenon – *horses, wheeled vehicles, and roads* – and the mental process – *were unknown* – present the sense of knowing to mean that the Phenomenon was not known by the implied *Senser*. However, the Circumstantial element of this clause – *in Egypt* – provides sufficient context for guessing and understanding that the implied *Senser* is actually the Egyptians or a great mass of people, as referred to in the previous clause.

On the other hand, another different kind of *Senser* and *Phenomenon* is presented in clause 3.1. This clause employs it serving as the *Phenomenon*, but the reference of it is unclearly defined in the clause. It is assumed that the meaning of the *Senser* and *Phenomenon* in this clause is as the introductory context for interpreting the subsequent clause in 3.1b since the writer focuses on the description of the *Circumstantial* element as the primary message carried by this clause. However, this particular process in this clause is incongruent since the participant can be categorized as the participant of the existential process, which, according to Eggins (1994:317), suggests that the action is framed as taking place within specific settings which are asserted as merely existing. Thus, this incongruent case of process type proves that the meaning and function of the clause is strongly influenced by the context of the situation of the clause and text.

Furthermore, in terms of *Circumstances*, the text enhances and extends several clauses by providing information dealing with background conditions of time, place, and manner. The *Circumstances* found in text A are listed and classified in the following table. It is shown that the circumstances of extent in the text provide the enhancement of information in terms of duration and the setting of time and place while the circumstances of cause concerns with providing information related to the purpose of the actions done by the participants. In addition, the *Circumstances* of Accompaniment in text A extend the information dealing with guise or the role and position of the participants in each clause. Thus, in conclusion, discussion on the experiential function of text A provides the characteristics of how the text describes the activities and participants and circumstances involved in the activities and how the text represents the experiences encountered and actions done by the most dominant doer participants (the Egyptians engineers).

CONCLUSION

As have been presented in the discussion, the findings of this study reveal that each text utilizes various language resources and is structured in certain ways to achieve its objectives. The historical text, as a kind of text which belongs to the genre of recount, aims at recounting event in the past. This text is structured by (1) the constant and continuous thematic progression to point out the Remarkable events happened in the past (ancient Egyptians civilization), (2) declarative clauses having positive polarity and validity for the past time, (3) the predominance of material clauses showing the emphasizing on recounting the action done by engineers of ancient Egypt. This text can be utilized for experiencing

the students to look at the historical text and the typical habit of doing and thinking of ancient engineers.

Next, the findings and discussion in this study reveal the characteristics of text, which might lead to the difficulty encountered by the students comprising lexical density (the density of information resulted from the tightness of the content words in sentences) and ambiguity in terms of the syntactic structure in clause complexes. The lexical density is mainly structured by nominalization in which the writer connects and combines a great deal of information into one nominal group. Consequently, this raises an emergence of explicit assistance for the students to understand the meaning and function of the elements constructing the nominal group, and the necessity to discuss the clause complexes in terms of clauses' dependency relation based on their meaning and function.

Thus, due to the text's linguistics complexity, unfolding the structure and pattern of each text is essential to be utilized as a critical consideration in designing and developing an English course syllabus and teaching material for the teaching of English in engineering class. The challenge is on how the lecturer facilitates the students not only to comprehend the content of the text but also to develop the students' language ability without losing focus on the content of the text, which leads to the dual focus of pedagogy incorporating the explicit attention to both language and content. Thus, by referring to the result of functional text analysis in this study, it is expected that it helps the lecturers in recognizing how language constructs the content of the reading text that they are teaching so that they can develop ways in dealing with the reading text and to engage students in a richer discussion about the content.

Due to its language complexity, some parts of text A needs to be simplified in some way, and the structure of clause complexes needs to be discussed with the students since the clauses are typically structured by complex combinations of clauses and Nominal Groups. At the beginning of the course, it is suggested that the discussions on the meaning and function of Nominal Groups, Verbal groups, adverbial groups, and Prepositional phrases are presented. It does not mean that the lecture needs to teach the grammar of those groups, but it is the discussions that are limited to the meaning and function of the structure of those groups. Furthermore, in explaining the text and assisting the students in reading the text, the lecturer needs to understand and refer to the result of functional text analysis by pointing out the integrated and dynamic interrelationship between bottom-up (grammatical) and top-down (rhetorical) approaches. It is based on the reason that

structural complexity exists in intra-sentential level, inter-sentential, and discourse-level, which requires the identification and explanation of the pattern within sentence and text. The lecturer can begin the explanation of the text by implicitly referring to the textual function, which is simultaneously followed by the interpersonal and experiential functions of the text.

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