CHAPTER V

CONCLUSION

This chapter comprises the summary of the study, summary of the findings, discussion of the results, pedagogical implication, and recommendations for further research.

Summary of the study

This study was conducted to investigate the frequency of the occurrences of complex sentences and to identify the subtypes of complex sentence used in three English academic books from three different fields: **"Accounting Principles"** in Social Science, **"System Dynamics"** inScience and Technology, and **"TIETZ Fundamentals of Clinical Chemistry"** in Health Science.

This study attempted to answer the following questions:

1. What was the proportion of complex sentences in three different fields of English academic books?

2. How often did each subtype of complex sentences appear in three selected books?

The population of this study wasthree English academic books used by Naresuan University from three different fields: **"Accounting Principles"** in Social Sciences field, **"System Dynamics"** in Science and Technology field, and **"TIETZ Fundamentals of Clinical Chemistry"** in Health Sciences field.

"Accounting Principles (2010)" in Social Sciences field was a book in the Courses of Accounting I and Accounting II. This book had 727 complex sentences.

"System Dynamics (2010)"in Science and Technology field was used in Simulation of Mechanical Systems Course and in Automatic Control Engineering Course. A number of complex sentences in this book were 1,491.

"TIETZ Fundamentals of Clinical Chemistry (2008)"in Health Sciences field was taught in the course of Clinical Chemistry I and II. The complex sentences in this book were 827 sentences.

Two research instruments were employed in this study. One was Biber, et al. 's framework (1999), which focused on finite dependent clauses. These clauses were classified into seven main types, namely, nominal clauses, adverbial clauses, relative clauses, comparative clauses and other degree clauses, reporting clauses, comment clauses, and other peripheral clauses. The extensive discussion of Biber, et al.'s framework is described in Chapter two. Another research tool was the table of subtype of finite dependent clauses judgment. It was designed to ensure that the table could measure target sentences.

Summary of the findings

The findings can be summarized as follows:

1. From the statistical data obtained on the research question one, the results showed that the percentage of complex sentence were 29.75, 36.50, and 32.14 in **"Accounting Principles"** in Social Science field, **"System Dynamics"** in Science and Technology field, and **"TIETZ Fundamentals of Clinical Chemistry"** in Health Sciencefield, respectively.

2. In **"Accounting Principles"** and **"System Dynamics"**, it is found out that adverbial clauses frequently occurred in the seven main types of finite dependent clauses while relative clauses was found at the highest frequency in **"TIETZ Fundamentals of Clinical Chemistry"**. Of all seven subtypes of adverbial clauses, time clauses were found in the highest frequency in **"Accounting Principles"** but conditional clauses were found the most in **"System Dynamics"**. From the investigation of complex sentences in the scope of subtypes of complex sentences, the findings revealed that relative clauses occurred in the highest frequency of 29 subtypes of finite dependent clauses in all three books.

Discussion of the Results

From the data analysis for two research questions, the results of this current study increase our understanding of what subtypes of finite dependent clauses in three English academic books from the different fields. The finding can be discussed and interpreted as follows:

1. Discussions of Finding One

The first research question aimed to find the proportion of complex sentences in three different fields of English academic books. The result found that there were 29.75 percent of complex sentences in **"Accounting Principles"** in Social Science field, 36.50 percent in **"System Dynamics"** in Science and Technology field, and 32.14 percent in **"TIETZ Fundamentals of Clinical Chemistry"** in Health Sciencefield. The analysis showed that complex sentences tended to occur approximately in one-third of all sentences in three selected academic books. This reflects how much they are so significant. For one important reason, these sentences make the content to be concise in that what they do is they combine two ideas into a single sentence. For example is below,

> These differ from specific identification in that they assume flows of costs that may be unrelated to the physical flow of goods.
>
> (Weygandt, Kimmel and Kieso, 2010, p. 255)

Below are two ideas before combined into a single sentence:

> These differ from specific identification in that they assume flows of costs.
> Costs may be unrelated to the physical flow of goods.

The two ideas could be expressed as two separate sentences, but they are more effectively expressed through a complex sentence, specifically an adjective clause in this case. If there are many simple sentences, the writing appear choppy and too plain, not sophisticated. To use subordinate clause is one of the solution to make the content interesting and colorful. Let's analyze another type of complex sentences, namely adverbial clauses. Basically, adverbial clauses have a subordinate clause with a word like **when, because, if, although**, etc. Adverbial clauses tell the reader such things as why, when, how and under what condition. Here is an example to show that an adverb clause also enables an author to subordinate one point to another:

> [**After** multiple lines have been scribed on the photoresist,] chemicals are used to dissolve elute the exposed photoresist to create the channels that become the lines of the grating.
>
> (Burtis, Ashwood and Eruns, 2008, p. 69)

This sentence highlights dissolution and elution of chemical, and is designed to fit into a paragraph like this:

> Modern holographic gratings are made using a laser in a "high-precision machining" mode. The focused beam of the laser is accurately scanned over a photosensitive material termed a "photoresist." [**After** multiple lines have been scribed on the photoresist,] chemicals are used to dissolve elute the exposed photoresist to create the channels that become the lines of the grating.

On the other hand, if the most important thing is the scribed multiple lines, the sentence should emphasize that:

> Modern holographic gratings are made using a laser in a "high-precision machining" mode. The focused beam of the laser is accurately scanned over a photosensitive material termed a "photoresist." The multiple lines have been scribed on the photoresist, [**after** chemicals are used to dissolve elute the exposed photoresist to create the channels that become the lines of the grating.]

In each version of the sentence, the adverb clause lets you indicate which of two points is more important.

Like the other two types of complex sentences, nominal clauses provide more information than a simple noun. Compare the following:

> From Example 1.4.2, we learned theory.
>
> From Example 1.4.2, we learned [**that** the following power function can describe the date: $\int = bh^m$]
>
> (Palm, 2010, p. 35)

Obviously, the first sentence is too broad and choppy. The second one is tremendously better since it is more specific and informative than the first one. It can be said that complex sentences are so essential because they change one form of language into another one which is not too flat and more informative. In other words, when used and formed correctly, they turn simple ideas into more complex and informative ones.

The results of this present study were consistent with the results found in the study conducted by Inchun (2005), which stated that complex sentences occurred one-third of all sentences (41.52 %) in research articles on transportation engineering from Science and Technology field. On the contrary, Chumjitt's research (2001) found 78.97 percent of complex sentences in "Using the Computer: Microsoft Office 97". In the results in three research studies including the current one, Chumjitt's research had the different result from Inchun's and current research in terms of the frequency of complex sentence. From the researcher's point of view, formula could be the main factor that made the result in Chumjitt's research different from others. All books in Inchun's and in current research took from the fields that used formula to explain the contexts while the computer book in Chumjitt's research had only the contexts. However, what the previous studies show us is how significance of complex sentences is in academia. Language learners cannot walk away or ignore these types of sentences.

2. Discussions of Finding Two

Research question two aimed to identify the subtype of complex sentences used in the three English academic books from the different fields. The results show that relative clauses occurred in the highest frequencyof all 29 subtypes of finite dependent clauses in all three books. The basic reason is that they are used to give more information to define or identify the things talked about. Relative clauses were employed to make the readers understand the contents more easily and more clearly. Biber, et al. (1999, p. 642) found that relative clauses were the most common in academic prose within the different text types: news, fiction, and conversation. Relative clauses were used to establish the reference of the antecedent and give additional information.A few research studies also support this. For example, Nuamthanom (2003) stated that English relative clauses can be used to convey

give/new information in discourse types. Similarly, Hyland and Tse (2010) stated that relative clause were often characterized in textbooks by their role in giving additional information about the head nouns so that readers/listeners are able to identify themmore easily or recovermore information about them.

In **"TIETZ Fundamentals of Clinical Chemistry"**, it is found out that relative clauses frequently occurred the most in the seven main types of finite dependent clauses while adverbial clauses were found at the highest frequency in **"Accounting Principles"** and **"System Dynamics"**. This current research was not consistent with Rafajlovičová (n.d.) because Rafajlovičová's research found adverbial clauses with 23.5% of all subordinate clauses in academic writing while the current research found 39.75%, 36.89%, and 36.40% in **"Accounting Principles"**, **"System Dynamics"** and **"TIETZ Fundamentals of Clinical Chemistry"** respectively.

Of all seven subtypes of adverbial clauses, time clauses and conditional clauses were found in two most frequency in selected books. Why are they? It is very possible that selected books involved with financial transactions which present data, facts, or processes of business, with the factual implication or hypothetical situations, and with a major application area in system dynamics. The researcher agrees with Biber, et al. (1999, p. 825) said that clauses of condition were important contributors to the development of arguments, which was a significant goal of academic writing and these clauses were important inacademic style. They played an important role in specifying conditions under which facts hold, so they were important when expressing cause and consequence. In terms of time clauses, these clauses were one of the most frequently found types in academic text. Based on Biber, et al.'s claim, time clauses were common only in fiction and news (Biber, et al., 1999, p. 820). The outcome of this study is quite unique, as the occurrence of a time clause in academic book was very frequent. They explain that in academic style there tend to be passages that describe time duration up to the present. (Biber, et al., 1999, pp. 841 – 848) However, as the source deals with work, which specific real situations are described using time relations, the time could be perceived as an important element.

From the characteristics of seven main types of finite dependent clauses, comment clauses and other peripheral clauses were not found in this study. It is very possible that comment clauses and other peripheral clauses express the speaker's

attitude to the main clause or his manner of asserting it. More interestingly, these two clauses are typical of conversation so that they were not found in the academic books.

In this study, two points are not explained in Biber, et al. (1999).

1. It was found that a relative clause which modified the head noun could occur after predicate. The predicate which relative clause followed was in passive voice structures. In this case, it was only found in **"TIETZ Fundamentals of Clinical Chemistry"**. Example:

> Wave fronts are formed [**that** reinforce those wavelengths in phase and cancel those not in phase].
>
> (Burtis, Ashwood and Eruns, 2008, p. 69)

From this sentence, the clause "that reinforce those wavelengths in phase and cancel those not in phase" was a relative clause which modified the head noun "wave fronts" and this clause occurred after the predicate "are formed"

(Note: The number of occurrence in this case is 3)

2. Since the books revealed formulas for explaining the context, some sentences used mathematical symbols to represent the predicate, particularly in **"TIETZ Fundamentals of Clinical Chemistry" and "System Dynamics"**. Example:

> The relationship of concentration to intensity of fluorescence emission is derived from the Beer-Lambert law and is expressed as $F = \Phi I_0 abc$
>
> [**where** F = relative intensity
>
> Φ = fluorescence efficiency (i.e., the ratio between quanta of light emitted and quanta of light absorbed)
>
> I_0 = initial excitation intensity
>
> a = molar absorptivity
>
> b = volume element defined by geometry of the excitation and emission slits
>
> c = the concentration in mol/L]
>
> (Burtis, Ashwood and Eruns, 2008, p.73)

When considered superficially, this could be a non-finite dependent clause. This sentence could be interpreted that the mathematical symbol "=" represented a predicate "is" as:

[where F = **(is)** relative intensity

Φ = **(is)** fluorescence efficiency (i.e., the ratio between quanta of light emitted and quanta of light absorbed)

I_0 = **(is)** initial excitation intensity

a = **(is)** molar absorptivity

b = **(is)** volume element defined by geometry of the excitation and emission slits

c = **(is)** the concentration in mol/L]

[**If** $a \leq 0$,] the free response does not decay to 0 and thus the time constant has no meaning.

(Palm, 2010, p. 93)

When considered superficially, this could be non-finite dependent clauses. This sentence could be interpreted that the mathematical symbol "≤" represented a predicate "is less than or equals" as:

[**If** a is less than or equals 0,] the free response does not decay to 0 and thus the time constant has no meaning.

(Note: A number of occurrences in this case are 20 and 124 in "TIETZ Fundamentals of Clinical Chemistry" and "System Dynamics", respectively.)

These two findings are entirely consistent with Inchun's findings in that Biber, et al. still has more room to expand.

Pedagogical Implications

From the findings in the present study, it can be seen that academic textbooks in three academic fields cannot avoid complex sentences. Therefore, they should be taught in writing or reading courses in order to encourage learners to gain more understanding of English academic texts. The findings are very supportive for teachers to know which type of complex sentences should be focused on in order to make their learners in different fields comprehend the contents of textbooks. In addition, teachers use the results of this study to design and improve English course when complex sentences are used as a teaching material. If teachers would like to help their learners learn and understand English textbooks better, they could teach learners about sentences structure, starting from simple sentences, compound sentences, and finally complex sentences. The teachers must show the text that has mixed types of sentences and should have a basic knowledge of all types of sentences. For complex sentences, teachers demonstrate how a complex sentence is formed by combining one dependent clause one independent clause. However, not only are their formed introduced, but their function must be discussed as well. Here are some structure the can be used in classroom teaching and learning.

> **Adjective clauses**
>
> Form: S + [that/which + (S) + V] + V
>
> Functions: modify subject
>
> Examples: An entry [**that** requires three or more accounts] is a compound entry.
>
> (Weygandt, KimmelandKieso, 2010, p. 57)

Exercise: A teacher gives some complex sentences that have relative clauses in each sentence. Then, have students choose or underline the relative clauses, and tell what main clause and relative clause are. And identify what each one modifies).

Examples: An entry [that requires three or more accounts] is a compound entry.

Main clause: An entry is a compound entry.

Relative clause: **that** requires three or more accounts

Modify: An entry.

Adverbial clauses

Form: S + V [subordinator (when/after/as/because/etc.) + S + V.] or [subordinator (when/after/as/because/etc.) + S + V], S + V.

Functions: to express time, manner, reason/cause, condition, result, and concessive.

Examples: Cuvets must be clean and optically clear [**because** etching or deposits on the surface affect absorbance values.]

(Burtis, Ashwood, and Eruns, 2008, p. 70)

Exercise: Give some complex sentences that have adverbial clauses in each sentence. Choose the correct expression to complete the sentence so that the adverb clause makes sense.

Examples: Cuvets must be clean and optically clear _____ etching or deposits on the surface affect absorbance values.]

☒ because ☐ when ☐ if

Noun clauses

Form: S + V + [that + S + V.]

Functions: object of verb

Examples: The cost principle dictates [**that** companies record assets at their cost.]

(Weygandt, Kimmel and Kieso, 2010, p. 10)

Exercise: Give some complex sentences that have adverbial clauses in each sentence. Find out the noun clauses in sentences and state what purpose they serve.

Examples: The cost principle dictates [**that** companies record assets at their cost.]

Noun clause: that companies record assets at their cost.

Object of the verb: dictates

After students learn the basic forms and functions of complex sentences, let's walk students through the real words by having them read English textbooks.

Recommendations of further research

Below are some recommendations for further research studies.

1. Further research should focus on non-finite dependent clauses because it is they occurred in academic books and some non-finite dependent clauses can hinder reading comprehension.

2. Other frameworks can be employed in future research studies.

3. Further research should study the books in the same field. The books could be from different academic year to see the frequency of complex sentences.

4. It is worthwhile to study finite or non-finite dependent clauses in other types of books such as fictions or non-academic books.