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**THESIS**

**NEEDS AND PROBLEMS ABOUT ACADEMIC ENGLISH  
READING OF VETERINARY UNDERGRADUATE STUDENTS  
AT KASETSART UNIVERSITY**



**THANCHANOK LORNARK**

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The main objective of this study was to investigate the present needs for reading English materials for academic purposes of veterinary undergraduate students at Kasetsart University, and problems that they encountered when reading English materials. This study was also conducted to explore reading strategies utilized by the veterinary students. The results were anticipated to reveal needs for academic reading in English of the veterinary students, their difficulties in English reading, and their reading strategies.

The subjects of this study were 100 third-year veterinary students at Kasetsart University, including 35 male students and 65 female students. The research instruments were a questionnaire and interview. The statistical devices used to analyze data consisted of frequency distribution, percentage (%), a five-point Likert scale, arithmetic mean ( $\bar{X}$ ), and standard deviation (S.D.).

This study indicated that the veterinary students highly needed to read textbooks, research articles, research journals, and research reports of their discipline. On the other hand, research reports of other disciplines were perceived as the lowest need. The main purposes of reading these materials were to seek information for a seminar paper and a term paper.

The students' important problems in English reading involved unknown words and technical terms, followed by problems in selecting an appropriate meaning of a word. However, grammatical knowledge was the least serious problem for them. Due to their lexical problems, the strategy they used the most was to consult a dictionary when unknown words were come across. The least frequent strategy was to read aloud when the texts became hard to understand.

The findings of this study will result in a clearer understanding of the students' needs and problems in English reading. This may provide a beneficial guideline for designing an English course in academic reading which meets their demands.

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Student's signature

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Thesis Advisor's signature

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# CHAPTER I

## INTRODUCTION

### Statement of the Problem

At the present time, English has assumed the role of the world's major international language because it is spoken in a large number of countries. Jenkins (2003) claims that the speakers of English as a native language and a second language number around 337,407,300 and 235,351,300 respectively. Besides, the users of English as a foreign language based on the criterion of reasonable competence amount approximately one billion. Most speakers of different first languages generally use English as the lingua franca in communicating with each other. In other words, English serves as the language of wider cross cultural communication. It can lead people with a variety of first language backgrounds to a mutual understanding. Technological advance and unceasing economic growth have also become primary factors which result in the increasing importance of English. A large majority of people want to learn English as it is becoming the accepted international language of technology and commerce (Hutchinson and Waters, 1987).

Therefore, English is the first foreign language studied at school or college in numerous EFL countries where it is not the mother tongue such as Vietnam, Japan, South Korea as well as Thailand. The continuous spread of need for English as a second or foreign language considerably affects the educational resources of many countries (Richards, 1985). In Thailand, English is a compulsory subject offered to students in each level of education ranging from elementary level to tertiary level. Richards (1985) states that English tends to be a compulsory subject taught at school. As well as other subjects, students have to pass an examination in English to enter a university. Furthermore, English may be the language used in certain courses or programs at a university and a large number of textbooks are also published in English.

In higher education, students in many areas such as engineering, medical science, nursing science or even computer science have great necessity of English. Another discipline in which English plays a crucial role is veterinary medicine. For veterinary students, reading is one of the most essential skills. The reason for this is that they need to read English textbooks, research articles and international journals to broaden their knowledge. Anderson (1999) points out that reading is an essential skill for students who study English as a second or foreign language. In many countries, learning how to read in a foreign language is highly important to academic studies, professional success, and personal development (Alderson, 1989).

Veterinary students at Kasetsart University are basically required to take four English courses which consist of Foundation English I, II, III and English IV. Most students tend to start with Foundation English I or II whereas some students might begin with Foundation English III or English IV. This depends on their scores on English for an entrance examination. Foundation English I, II and III focus on knowledge of grammatical points, language functions, vocabularies and four macro skills (reading, writing, listening and speaking). Regarding English IV, the students can take any course in which they are interested. The Faculty of Humanities has provided the veterinary students with the course relating to their discipline, i.e., Technical English for Veterinary Medicine which focuses on practicing reading skills to familiarize them with technical terms and to encourage them to interpret veterinary textbooks and periodicals.

However, the course of Technical English for Veterinary Medicine was designed many years ago and it was not based on veterinary students' needs. The content of this course may not be suitable for the current students whose needs differ from the needs of the students in the early years. For this reason, it is important to conduct reading needs analysis of the veterinary students at Kasetsart University (KU). The course which serves the students' actual needs can help them improve their reading proficiency.

To design the specific course, the present situation with regard to their needs and problems about English reading must be probed. The survey will benefit the construction and development of an ESP course which better serves the students' particular needs. Strevens (1977) defines ESP courses as those in which the aims and the content are on the basis of the learners' functional and practical requirement for English. The examples of ESP are English courses for medical doctors, for meteorologists, for secretaries, for businessmen, for air traffic controllers, for nurses, for chemical engineers, for students of physics etc.

Nunan (1990) remarks that the first step to develop the ESP course is to conduct a needs analysis (NA) of the language and to study the students' requirements of language skills. For curriculum planning, Richards (1985) suggests that needs analysis is undertaken to identify what a particular group of learners expect to use English for and what their present level of competence is. Needs analysis serves three main purposes in language curriculum development. Firstly, it provides a means of obtaining wider input into the content, design and implementation of a language program. Another one is that it can be used in developing goals, objectives and content. Finally, it can provide data for reviewing and assessing an existing program (Richards, 1990).

Despite the rapidly expanding research on various aspects on second and foreign language reading, there is little previous research that focuses on the specific needs in English reading of veterinary students. This study is thus conducted to investigate the needs for reading academic materials in English of veterinary undergraduate students at Kasetsart University and to identify their difficulties in English reading. The results of this study are anticipated to serve as a useful guideline for both course designers and teachers of English for veterinary students.

### **Objectives of the Study**

The objective of this study is to investigate the present needs for reading English materials for academic purposes of veterinary undergraduate students at

Kasetsart University, and problems confronted by those students when reading academic materials in English. This study also aims to investigate English reading strategies utilized by the veterinary students. The findings reveal needs for academic reading in English of the veterinary students and difficulties in English reading that they encounter in their discipline as well as reading strategies which help them understand texts.

### **Research Questions**

This study is conducted to answer the following research questions.

1. To what extent do veterinary undergraduate students at Kasetsart University need to read English materials of their discipline?
2. What are the important problems of the veterinary students when reading English materials of their discipline?
3. What are the strategies that the veterinary students use when reading English materials of their discipline?

### **Scope of the Study**

In this research, the focus is on needs for reading academic English materials, problems in English reading, and reading strategies. The subjects were the third-year veterinary students at Kasetsart University (KU). The instruments used for an investigation of the subjects' opinions are a questionnaire and interview. Furthermore, since this study focuses on the KU veterinary students, the results may not be generalized to the development of an English course in reading for veterinary students at other universities in Thailand.

### **Significance of the Study**

This study will raise the KU veterinary students' awareness of needs and problems about English reading. This is possibly advantageous to the improvement of their English reading skills. Moreover, the results of this study may provide course designers with a practical guideline for the construction of an English course in academic reading which fulfills the actual needs of the veterinary students.

### **Definition of Key Terms**

There are some specialized terms which are usually mentioned throughout the paper. To ensure more understanding and avoid misinterpretation, these terms are clarified as follows:

**Veterinary students** refer to undergraduate students who study at the Faculty of Veterinary Medicine at Kasetsart University.

**Needs** can be defined as English language requirements of veterinary undergraduate students for reading academic English materials such as textbooks, research articles, and research journals of their discipline.

**Problems** can be defined as difficulties of veterinary undergraduate students in reading academic English materials of their discipline.

**Academic reading** refers to veterinary undergraduate students' reading academic English materials of their discipline such as textbooks, research articles, and research journals necessary for writing up a term paper, preparing for examinations, and completing an assignment.

## CHAPTER II

### LITERATURE REVIEW

This chapter presents a review of literature on needs analysis in the field of English for specific purposes (ESP). The chapter is divided into four sections. In the first section, definition and types of ESP are reviewed. The second section is concerned with definitions of needs analysis (NA), types of needs and frameworks of needs analysis. The third section discusses problems in ESL/EFL reading and reading strategies for non-native readers. Previous research relevant to English needs analysis in academic fields and the use of English reading strategies are described in the final section.

#### **English for Specific Purposes (ESP)**

According to Hutchinson and Waters (1987), English for Specific Purposes (ESP) was developed in 1960 and became recognized in different countries. The rise of ESP was influenced by the rapid growth of technology and commerce, the emergence of new ideas of the study of the language, and learners' needs and interests. ESP was originally known as English for Special Purposes, but many scholars and practitioners now refer to it as English for Specific Purposes which focuses on the purpose of the learners and covers a wide range of language resources (Robinson, 1980).

#### **Definition of ESP**

Streven (1977) defines ESP courses as those in which the aims and the content are determined by the learners' functional and practical requirements for the English language, not by general education as when English is a school subject. The examples of ESP are English courses for medical doctors, for meteorologists, for secretaries, for

businessmen, for air traffic controllers, for nurses, for chemical engineers, for students of physics etc.

Mackey and Mountford (1978) states that ESP is a form of English Language Teaching (ELT) which differs from English as a Second Language (ESL) and English as a Foreign Language (EFL). The purpose of ESP courses is to meet the aims of the learner. Therefore, designing ESP courses is based on the learner's purposes.

Additionally, "ESP courses are those where the syllabi and materials are determined in all essentials by the prior analysis of communication needs of the learner, rather than by non-learner-centered criteria such as the teacher's or institution's predetermined preference for General English, or for treating English as part of a general education (Munby, 1978: 2)."

The ESP course is explained by Robinson (1980) that it is designed to satisfy the needs of students with identical or nearly identical purposes. These needs will be fairly specific and will be occupation or study based. The content of the course is based on an analysis of students' needs. An ESP course is aimed at successful performance in occupational and educational roles.

Streven (1980) offers a further definition that ESP is English language instruction related to occupations or areas of study and devised to meet the learner's specific needs. The content of ESP is selective and the language skills are also restricted.

Furthermore, Hutchinson and Waters (1987) note that ESP focuses on the learners. Different learners have different needs and interests, which have an influence on their motivation to learn and the effectiveness of their learning. An English course designed to serve their needs would improve the learners' motivation and make their learning better and faster.

This study aims to investigate the needs and problems of veterinary students at Kasetsart University in reading academic English materials. An English course in reading which will be designed to meet the students' needs can be regarded as English for Specific Purposes (ESP). ESP is an approach to language learning and teaching based on the learners' needs, interests and aims to use the English language in specific contexts.

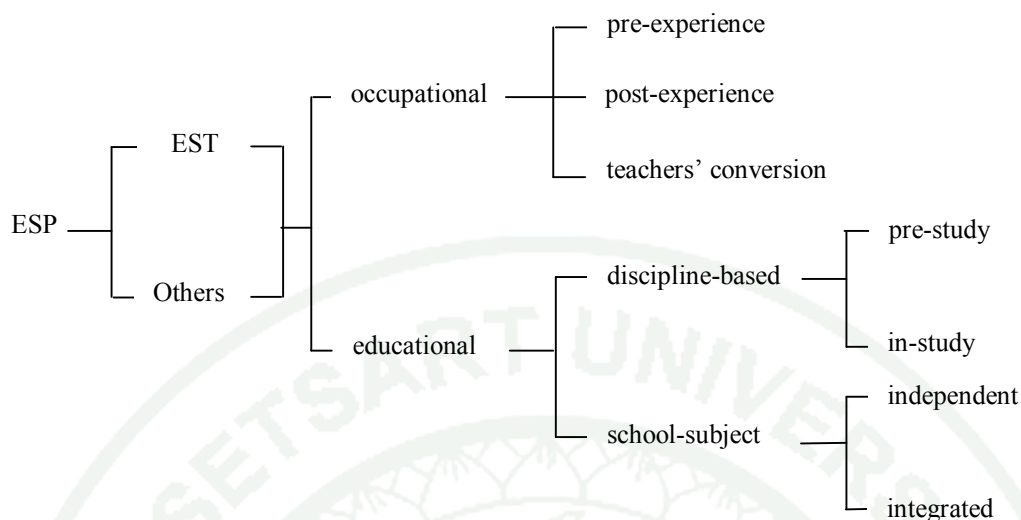
In this research, ESP is the course developed to fulfill the needs of veterinary undergraduate students at Kasetsart University (KU). The content of the course and teaching materials are determined by the veterinary students' opinions as to their actual needs for reading academic English materials and the problems they encounter when reading as well as their use of reading strategies.

### **Types of ESP**

English for Specific Purposes (ESP) is categorized into many types by ESP scholars and experts. Strevin (1977) summarizes a taxonomy of ESP courses in Figure 1.

According to the figure, ESP is first distinguished between English for Science and Technology (EST) and all other ESP. ESP is then classified into occupational and educational courses. Occupational ESP involves a job, occupation or profession such as English courses for fire-fighters airline cabin staff or teachers. Occupational ESP is subdivided into pre-experience, post-experience and teachers' conversion courses.

On the other hand, educational ESP relies on educational goals and the framework within which it is offered. Educational ESP is differentiated between discipline-based and school subject courses. The first type of courses which involves the study of a discipline, e.g. physics, chemical engineering, tropical agriculture is divided into pre-study and in-study ESP. Besides, the second one is separated into independent and integrated courses.



**Figure 1** A Taxonomy of ESP Courses

Source: Streven (1977: 92)

Mackey and Mountford (1978 cited in Robinson, 1980: 6) suggest three major purposes of language learning:

1. occupational requirements, e.g., for international telephone operators, civil airline pilots, etc.
2. vocational training programmes, e.g., for hotel and catering staff, technical trades, etc.
3. academic or professional study, e.g., engineering, medicine, law, etc.

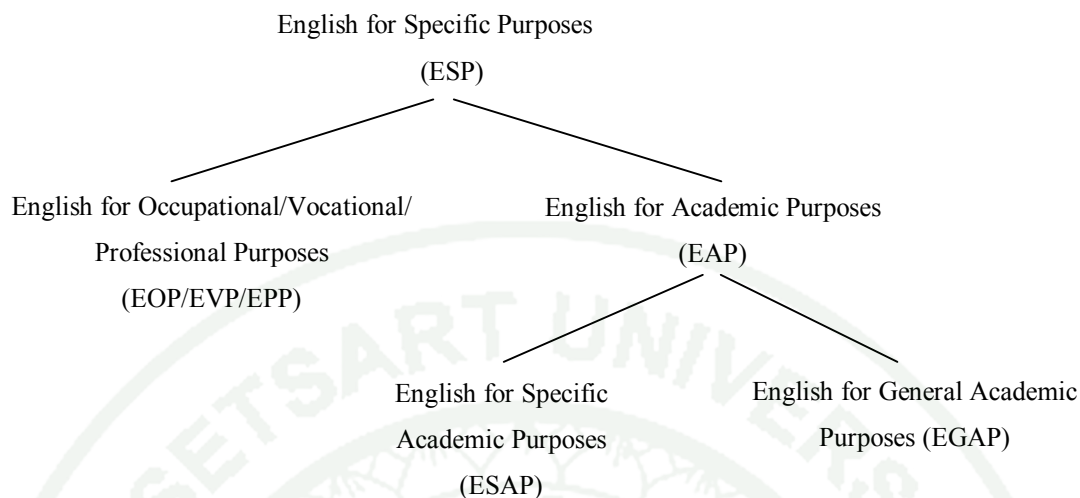
McDonough (1984) classifies ESP into two major groups: English for Academic Purposes (EAP) and English for Occupational Purposes (EOP). EAP is also subcategorized into the main offshoot, English for Science and Technology (EST). Furthermore, ESP is divided into many branches due to the industrial growth. The following are some examples:

- EBP English for Business Purposes
- VESL Vocational English as a Second Language
- EEP English for Educational Purposes
- SPLT Special Purpose Language Teaching
- LSP Language for Special Purposes
- EMP English for Medical Purposes
- ERP English for Recreational Purposes

McDonough also points out that the titles of most ESP courses begin with the word 'English'. The examples are English for Electronic Engineering, English for Computer Scientists, English for Hotel Staff, English for Nurses, English for Doctors, English for Airline Pilots, English for Technicians, etc.

Another classification is proposed by Jordan (1997) who divides ESP into two main strands, English for Occupational/Vocational/Professional Purposes (EOP/EVP/EPP) and English for Academic Purposes (EAP). See Figure 2. The former is concerned with English for doctors, airline staff, hotel staff, etc. On the other hand, the latter is subdivided into two types, English for Specific Academic Purposes (ESAP) such as English for medicine, engineering and economics, and English for General Academic Purposes (EGAP) such as listening and note-taking, academic writing, reference skills and seminars and discussions.

Therefore, the English course in reading for the KU veterinary students can be classified as English for Academic Purposes (EAP). The reason for this is that the course will be designed to serve the needs for academic English reading of the students of a specific discipline.



**Figure 2** Classification of ESP

Source: Jordan (1997: 3)

### Needs Analysis

Robinson (1980 cited in Richards, 1990) suggests that needs analysis has been greatly influenced the design of special-purposes program and a considerable literature now exists on the role of needs assessment in English for specific purposes (ESP). Needs analysis is now widely accepted as a fundamental principle of programme design which is essential for the specification of language learning objectives (Brindley, 1989). Additionally, Nunan and Lamb (1996) explains that needs analyses intend to categorize and group learners. This process helps specify content and learning procedures relevant to collected data about the learners.

### Definitions of Needs Analysis

Needs analysis is defined by many scholars in various ways and from different viewpoints as follows:

Richterich and Chancerel (1980 cited in Robinson, 1980) explain that needs analysis is an ongoing process and is not restricted to the beginning of a course. They realize that a learner's needs may change even while the learner is taking a language course due to many factors such as a change in his financial resources, a change in his job, a modification of his objectives resulting from his (lack of) progress in the course.

Stevenson (1980:109) notes that needs analysis is "a procedure starting from the standpoint that it is not 'general English' and that the learner (or his sponsor) can apply comprehensive information about the aim, purposes, needs, wants, roles, and functions for which English is required in his or her circumstances."

According to Brindley (1989), there are two orientations to needs analysis. The first one is based on the 'narrow' or 'product-oriented' interpretation of needs by means of which the learners' needs are perceived in the terms of the language they have to use in a particular communication situation. Thus, needs analysis is a process of investigating the learners' current and future language use. Another one called the 'broad' or 'process-oriented' interpretation of needs is seen in terms of the needs of the learner as an individual in the learning situation. In this case, affective and cognitive variables which affect learning are taken into account. Those variables are the learners' attitudes, motivation, awareness, personality, wants, expectations and learning styles.

Needs analysis refers to procedures concerned with the collection of data from various sources such as the data about the learners, the materials and so on. The aims of needs analysis are to identify the types of situations in which a particular group of learners will use English, activities they are expected to carry out in English and their current language skills with respect to those tasks (Richards, 1985).

Richards and Rogers (1986: 156) state that needs analysis means "the identifying of general and specific language needs that can be addressed in developing

goals, objectives, and content in a language programme. It may focus either on the general parameters of a language programme or on the specific needs.”

Nunan (1988: 45) defines needs analysis as “a set of procedures for specifying the parameters of a course of study. Such parameters include the criteria and rationale for grouping learners, the selection and sequencing of course content, methodology, course length, intensity, and duration.”

Ellis and Johnson (1994: 222) point out that needs analysis is “a method of obtaining description of a learner’s needs (or group of learners’ needs). It will take into account the specific purpose for which the learner will use the language, the kind of language to be used, the starting level, and the target level, which is to be achieved. The information could be obtained from a range of different people: company staff, trainers, and the learners themselves. It will have implications for the approach to training that will be taken.”

In this study, needs analysis can be defined as the procedures used to examine the veterinary students’ opinions on what they found conducive to their academic reading. This study aims to probe the needs and problems about academic English reading of the veterinary students. The findings will benefit the planning and development of language curriculum in the future. Brindley (1989) remarks that teaching/learning programs should serve learners’ needs which become one of the basic principles underlying learner-centered systems of language learning.

### **Types of Needs**

According to Mackay (1978: 28), needs are categorized into two types, academic needs and job needs.

1. Academic needs refers to the requirement of English for further academic study. For instance, medical students require English to understand technical term and lectures as well as read medical textbooks in English.

2. Job needs is considered as the requirement of English for performing a particular practical job, e.g., technician requiring English to work on a project in which English is used.

Another classification of needs is suggested by Richterich and Chancerel (1980: 32) as follows:

1. Objective needs is those which can be inferred from job analysis or from a study of a person engaging in the duties of his profession.

2. Subjective needs can be described as those that depend on the people one meets or the events taking place in an unforeseen situations.

Hutchinson and Waters (1987: 54) distinguish between the two needs, target needs and learning needs.

1. Target needs refers to what the learners need to do in the target situation. The target needs can be sub-divided into 'necessities', 'lacks' and 'wants'. Necessities are what the learners have to know so as to function effectively in the target situation. Lacks are the gaps between the target proficiency and the existing proficiency of the learners. Wants can be described as the perception of the learners' needs, i.e., wants are what the learners feel they need.

2. Learning needs is what the learners need to do in order to learn. This type of needs covers all of the factors related to the learning process, e.g., the learners' attitudes, motivations, awareness, personality, learning styles and strategies, and social background.

Brindley (1989) divides the types of needs into two groups, objective needs and subjective needs.

1. Objective needs refers to needs which can be derived from different kinds of factual information about learners, their use of language in real-life situation, their current language proficiency and language difficulties. Therefore, the purpose of objective needs analysis is to set broad goals related to language content.

2. Subjective needs is regarded as the cognitive and affective needs of the learners in the learning situation, derivable from information about affective and cognitive factors such as personality, confidence, attitudes, learners' wants and expectations with respect to learning English and their individual cognitive style and learning strategies. This kind of needs aims to gather information about learners which can be used to guide the learning process.

This study was mainly based on Mackey's academic needs. The reason for this is that the research objective is to explore veterinary students' needs for reading English texts in their discipline rather than to explore the English needs in their job. In addition, this research was related to Hutchinson and Waters' learning needs because it intends to probe veterinary students' needs, their awareness of problems in reading English materials and strategies they use to enhance their reading comprehension.

### **Frameworks of Needs Analysis**

This section is related to the different frameworks of needs analysis. According to Munby (1978), needs analysis can be categorized into two areas: Target Situation Analysis (TSA) and Present Situation Analysis (PSA).

#### **Target Situation Analysis (TSA)**

Target Situation Analysis (TSA) is considered as an analysis of learners' English language needs in occupational or educational situations and focuses on the learners' needs at the end of the course (Robinson, 1991). Hutchinson and Waters (1987) view the target situation in terms of necessities, lacks and wants. Necessities are what the learners have to know to function effectively in the target situation

whereas lacks can be defined as the gap between the target proficiency and the existing proficiency of the learners. Wants refer to the learners' perceptions about their necessities and lacks. The analysis of target situation needs is a matter of asking questions about the target situation and the attitudes towards the situation of various participants in learning process

### **Present Situation Analysis (PSA)**

Hutchinson and Waters (1987) remark that present situation analysis (PSA) or learning situation analysis is a needs analysis which tries to establish what the students are like at the start of their language course. In addition, PSA investigates the students' strengths and weaknesses in order to design an English course that suits their language proficiency.

Richterich and Chancerel (1980) report that the PSA ascertains the students' state of language development at the beginning of the language course. The information about the learners' needs should be based on three basic sources: the students themselves, the teaching establishment and the user-institution, e.g. place of work, sponsoring body, etc. It can be seen that needs analysis is likely to be influenced not only by the wants of the learners themselves, but also by the expectation of the user-institution. The methods of data collection are surveys, questionnaires and interviews. Information is sought on levels of ability, resources and views on language teaching/learning. Furthermore, the learner is at the centre of the system, which includes the surrounding society and culture.

In addition, Nunan and Lamb (1996) propose five needs analysis instruments used to collect a wide range of information on the learner's needs. The first instrument is designed for *a survey of general learner needs* which requires the respondents to provide information such as personal and educational background, language learning history, current language proficiency level, and purposes for using English. The second instrument is *a language contact survey* focusing on the learner's decision of which uses of the English language are important for them in different

situations. One of these five instruments is *a methodological preferences survey*. This instrument is employed to investigate how the respondents like to learn English by choosing the answers “yes” or “no” to various learning methodologies. The fourth instrument is *a survey of subjective experiences of the learner* designed to examine what students think about learning another language. The other instrument is *a survey of prospective course* involves the investigation of learners’ attitudes towards different topics, e.g., what they like to learn and how they like to learn.

In this study, the researcher constructed the questionnaire based on the target situation analysis framework in terms of necessities and lacks. Furthermore, the two instruments of Nunan and Lamb (1996), *a survey of general learner needs* and *a language contact survey* were applied to developing the questionnaire.

### **ESL and EFL Reading**

Reading is one of the essential skills for university study and an important part of all university courses. For second-language speakers of English, reading can help them gain new ideas and practice their English skills. When reading, they can learn new words organized in academic writing (Lewis and Reinders, 2003).

The purposes of reading at university are to understand the lecture, to find answers to questions and to improve English skills. Reading materials for university students include textbooks, journal articles, research reports and theses (ibid.). It is certain that a vast majority of students who learn English as a second language (ESL) and as a foreign language (EFL) are usually faced with difficulties in reading English texts.

### **Problems in ESL and EFL Reading**

Alderson (1989) addresses that learners of English as a Foreign Language (EFL) and of other foreign languages generally require a reading ability. Nonetheless, EFL teachers often encounter the ordinary problems about most students’ failure to

learn to read adequately in a foreign language. Those students tend to read in a foreign language with less understanding than they are expected to have. Furthermore, the rate of their reading foreign language texts is slower than reading in their native language.

For most second language readers, the major problem in academic reading is the gap between what they know and what native speakers know in relation to the language and the content of the text, as nearly all authentic texts are for native speaking readers (Li and Munby, 1996).

MacNamara (1970) studied French-English bilinguals' reading proficiency and found that knowledge of vocabulary and grammar seemed to be the key factor in poorer reading performance in the second language.

Nuttall (1996) remarks that some kinds of lexical items and some ways in which words are used can cause difficulty to foreign language readers. The lexical items which become the potential problems for second language readers include idioms, words with several meanings, sub-technical vocabulary, metaphors, irony, and superordinates that denote a general class under which a set of subcategories is subsumed.

The study conducted by Cohen and his colleagues (1979) revealed that non-native readers of English texts in sciences and economics often confronted a problem about synthesizing information across sentences and paragraphs because they did not pay attention to conjunctive words in their specialized texts. This is asserted by Mackey (1979: 241) who claims that 'recognition of conjunction and other intersentential linguistic devices is crucial to the information-gathering skills of second language readers.'

Another problem in reading is that many non-native readers attempt to read word by word although they are able to read effectively in their first language. This can build up significant barriers to their reading comprehension (Eskey and Grabe,

1988). In addition, readers of a second language often look up the meanings of unknown words in dictionaries, which are more likely to disrupt their reading process (ibid.). Nuttall (1996) also emphasizes that breaking off to consult a dictionary can make reading slower and interrupt thinking, which should be following the development of thought in the text.

Furthermore, Carrell (1988) identifies insufficient background knowledge as the cause of some students' reading difficulties. Second-language readers may not acquire a particular schema or background knowledge adequately. The reason for this is that the schema is specific to some culture and is not part of the readers' background. Carrell and Eisterhold (1988) similarly argues that the readers will have a better understanding of texts based on their own culture than those based on a less familiar culture because their background or schematic knowledge construct the meaning of texts.

In conclusion, non-native readers of English texts have problems in reading due to inadequate knowledge of vocabulary and grammar, ineffective use of a dictionary, and insufficiency of background knowledge. These problems provided guidelines for the development of questionnaire items concerning problems in reading academic English materials.

### **Reading Strategies Used by Non-Native Readers**

Jordan (1997) states that reading for academic purposes is a multifaceted subject. When students read, it is for a purpose. It is obvious that students can have different purposes in their reading. They may read to obtain information (facts, data etc.), to understand ideas or theories, to discover authors' viewpoints and to seek evidence for their own point of view. Therefore, differences in reading purposes will have influence on the readers' selection of approach to reading, initial reading strategies and the type of texts they will use (Thawut, 1996).

Olshavsky (1977) regards reading strategies as a means of understanding the writer's message whereas Pritchard (1990, cited in Urquhart and Weir, 1998) explains that a strategy is a deliberate action that readers take to enhance their reading comprehension. It can be concluded that a strategy is a way of solving problems while reading (Urquhart and Weir, 1998).

Based on the study of Olshavsky (1977), reading strategies can be classified into three levels: word related strategies, clause related strategies and story related strategies. Words related strategies include the use of context to define a word and synonym substitution. Clause related strategies consist of re-reading, inferences, addition of information, personal identification, and hypothesis. Finally, story related strategies refer to use of information in story to solve a problem.

Sarig (1987, cited in Urquhart and Weir, 1998) views responses to any particular problems as 'moves' and strategies as combinations of moves. Sarig categorizes reading strategies into three main groups. The first group is technical aid concerned with skimming, scanning, and skipping. The second group of reading strategies is coherence detecting which consist of identification of macroframe, use of content schemata, and identification of key information in text. The other group is clarification and simplification monitoring that relates to syntactic simplification, using synonym, circumlocutions, change of planning, mistake correction, ongoing self-evaluation, controlled skipping, and repeated reading.

According to Nuttall (1996), strategies for coping with reading difficulties are divided into two groups: word attack skills and text attack skills. The former involves the use of structural information to assign meaning to a word, gaining a rough idea of a word's meaning from the context in which it occurred, and making the best use of the information in the dictionary. The latter is composed of eight skills as described below:

1. understanding syntax
2. recognizing and interpreting cohesive devices
  - 2.1 interpreting pro-forms
  - 2.2 interpreting elliptical expressions
  - 2.3 interpreting lexical cohesion
3. interpreting discourse markers
4. recognizing functional value
5. recognizing text organization
6. recognizing the presuppositions underlying the text
7. recognizing implications and making inferences
8. prediction

Jordan (1997: 143-144) suggests strategies, skills and sub-skills necessary for reading, which can be summarized as follows:

1. prediction
2. skimming (reading quickly for the main idea or gist)
3. scanning (reading quickly for a specific piece of information)
4. distinguishing between:
  - 4.1 factual and non-factual information
  - 4.2 important and less important items
  - 4.3 relevant and irrelevant information
  - 4.4 explicit and implicit information
  - 4.5 ideas and examples and opinions
5. drawing inference and conclusions
6. deducing unknown words
7. understanding graphic presentation (data, diagrams, etc.)
8. understanding text organization and linguistic/semantic aspects, e.g.
  - 8.1 relationships between and within sentences (e.g. cohesion)
  - 8.2 recognizing discourse/semantic markers and their functions

To sum up, although reading strategies are categorized in different ways, they are efficient tools which can help non-native readers deal with problems in reading and improve reading comprehension. This study aims to identify reading strategies that veterinary students use to acquire better understanding.

## **A Review of Related Research**

Needs analysis greatly benefits course design and teaching materials development in special language programmes. Surveys of English needs for academic purposes have been conducted in various fields in order to provide suggestions for improving language curriculum. This part of the study contains previous research on English needs analysis in academic fields and the use of English reading strategies.

### **Studies on English Needs Analysis in Academic Fields**

Ongsakul (1984) investigated opinions of teachers of English and those of engineering students at King Mongkut's Institute of Technology, Lardkrabung concerning the needs and problems of learning and teaching technical English at KMIT. Questionnaires were used as the instrument to collect data from English teachers and engineering students in the 1983 academic year. The findings revealed that reading was the most needed skill in learning technical English. The important problems involved the objectives and content of the English curriculum, time and teaching techniques.

Chirapan (1987) studied graduate students' needs and problems, their wants and their subject-specific instructors' expectations regarding the English program for graduate students at the Faculty of Science, Mahidol University. Data was gathered using questionnaires distributed to graduate students in three disciplines: Life Sciences, Physical Sciences and Applied Linguistics, and to instructors at the Faculty of Science, Mahidol University. The results showed that reading was used the most, followed by writing, listening and speaking respectively. Life Science students had to use English in a wider range of activities than those in the other disciplines did.

Furthermore, students usually preferred listening and speaking skills whereas their instructors required skills and activities related to the needs in the target situation.

Uraisakul (1988) carried out the research to identify problems, wants and needs in learning and using English of the undergraduate computer students at the Faculty of Science, the University of the Thai Chamber of Commerce. Data were collected from the computer students using questionnaires and from the computer instructors by conducting interviews. The findings indicated that the students had a very great need for reading, great need for writing, moderate need for listening and speaking. Conversely, the language skill they wanted to improve most was speaking skill. In addition, the computer instructors considered that the students had moderate need for reading and little need for the other three skills.

Soranastaporn (1993) investigated the needs, problems and wants in English language teaching and learning of nursing students at nursing colleges under the Control of the Nursing College Division, Office of the Permanent Secretary, Ministry of Public Health, Thailand. The subjects were categorized into two groups: permanent nursing teachers and fourth year nursing students of Diploma in Nursing Science. The instrument used to survey the subjects' opinions was a questionnaire. The study revealed that reading skills were strongly needed. Similarly, reading skills was the most important problem for the students. Nevertheless, the students wanted to practice listening and speaking, while their teachers wanted them to practice reading and writing.

Khemateerakul (1996) conducted needs analysis to provide guidelines for the improvement of the intensive English course of the international program at Bangkok University. The study aimed to investigate the needs, wants and problems in using English of first year, second year, third year students and instructors of the international program of Bangkok University. The findings showed that students had the greatest need for listening, followed by reading, writing and speaking. Students considered all four English skills as moderate problems whereas their instructors considered writing and speaking skills as the most important problems. Additionally,

both students and instructors wanted listening skill to be emphasized in the intensive English course.

Sucompa (1998) surveyed the English language needs and problems in the tourism industry in Thailand to determine content, method and duration of the Technical English course for tourism for Higher Certificate level students at Rajamangala Institute of Technology (RIT). The subjects were composed of tourism workers, employers or owner of travel agencies, English language teachers and tourism students. The results pointed out that tourism workers needed to read, speak and listen more than to write and translate. Employers or owners of travel agencies considered that speaking was the most important skill. Similarly, English language teachers revealed that the most important skill was speaking, followed by reading, listening, writing and translating respectively. On the other hand, RIT tourism students considered translation as the most important skill. Regarding the course content, the focus was on the instruction of English for Tourism and general English, development of four English skills as well as translation. Classroom activities necessary for teaching English for RIT students included role plays, group work, and pair work. Additionally, the findings revealed that the subjects preferred the 4-6 class periods per week.

Naruenatwatana (2001) conducted a study to explore the needs of the medical students at Rangsit University in using academic English. There were three groups of participants consisting of 297 medical students, 7 teachers of English and 10 subject teachers in the 1999-2000 academic years. The tool for gathering data was three sets of questionnaires. The three groups of participants had great need in the use of four English language skills, most particularly reading skills. The medical students wanted the course to be elective and be offered in the first year of study, whereas most of teachers in both groups preferred a compulsory course and wanted their students to take the course more than one year.

According to Ongsakul (1984), Chirapan (1987), Uraisakul (1988), Soranastaporn (1993), and Naruenatwatana (2001), reading was the most necessary

skill for studying in a variety of scientific fields such as engineering, computer science, nursing science, and medical science. On the contrary, the study carried out by Khetmateerakul (1996) indicated that the most essential skill for the undergraduate students in the international program of Bangkok University was listening. It can be concluded that language needs varies from students in the area of science to those of other disciplines.

Since veterinary medicine is one of the science areas of study, it is important to investigate veterinary students' needs for reading academic English materials and the problems they usually encounter while reading.

### **Studies on the Use of English Reading Strategies**

Sheorey and Mokhtari (2001) examined differences in the use of reading strategies of native and non-native English speakers when reading academic materials. The participants in this study were 152 ESL students and 150 native-English-speaking American students. The data were collected through the Survey of Reading Strategies (SORS) to discover reading strategies used by the participants. The results pointed out that both groups of students with high reading ability showed degrees of higher usage for cognitive and metacognitive reading strategies than low-reading-ability students. Unlike the American students with low-reading ability, the counterparts who had high reading ability tended to consider support reading strategies to be relatively valuable. Conversely, ESL students gave high value to support reading strategies, regardless of their reading ability level.

Mokhtari and Reichard (2004) investigated whether significant differences exist between first and second language readers in their metacognitive awareness and usage of specific strategies when reading in English for academic purposes. The subjects were 350 college students consisting of 209 Moroccan and 141 American. The instrument used in this research was the Metacognitive Awareness of Reading Strategies Inventory (MARS), designed to measure their metacognitive awareness of reading strategies. The findings revealed that both groups of students had remarkably

similar patterns of strategy awareness and use when reading academic materials in English. Nevertheless, Moroccan students used certain types of strategies more frequently than did American students.

Tanthanis (2007) studied the English reading comprehension strategies of first-year students and compared the English reading comprehension strategies between male and female first-year students at high and low levels of English reading comprehension. The subjects were 107 first-year students of Thammasart University (Lampang campus). The instrument used in this study was a questionnaire. It was found that first-year students used the compensatory reading strategy more often than other strategies and the cognitive reading strategy was the least frequently used strategy. Furthermore, female students used cognitive, metacognitive and compensatory reading strategies more than did male students.

Yutdhana (2007) conducted a study of online reading strategies used by the graduate students of Naresuan University. The samples were 205 non-native graduate students from three faculties: health sciences, social sciences, and science and technology. The research instrument was the modified Online Survey of Reading Strategies (OSORS). The results showed that the graduate students used global reading strategies, problem-solving strategies, and support strategies at the medium level. On the whole, the graduate students of health sciences used the reading strategies at the high level while the graduate students of social sciences and science and technology used the reading strategies at the medium level

Huang et al. (2008) explored EFL learners' online reading strategies and the effects of strategy use of comprehension. The participants were 30 students majoring in applied English at a university of technology in northern Taiwan, divided into a high group and a low group based on their proficiency levels. They were asked to read four authentic online texts; two were appropriate to the students' proficiency, and two were more difficult. The results indicated that the use of support strategies dominated the strategy use and contributed to comprehension gains. On the whole, the use of

global strategies significantly contributed to better comprehension, especially for low proficiency students.

In summary, the previous studies of Sheorey and Mokhtari (2001), Mokhtari and Reichard (2004), Tanthanis (2007), Yutdhana (2007), and Huang et al. (2008) measured broad categories of reading strategies, e.g., metacognitive strategies, cognitive strategies, and support strategies. Additionally, there was little research on English reading strategies used by veterinary students. Therefore, this study aimed to investigate the use of specific reading strategies of the KU veterinary students.

The prior studies also indicated that a questionnaire was the main instrument for investigating the reading strategies used by their participants. Accordingly, the researcher used a questionnaire as a tool for measuring the subjects' use of reading strategies.

Reading plays a significant role in higher education because most specialized students need to read academic materials which are largely published in English (Swales, 1985). However, English reading becomes difficult skills for non-native students and often causes difficulties in comprehending the meanings of texts. This study thus aims at exploring the needs and problems in English reading of veterinary undergraduate students at Kasetsart University as well as discovering the micro strategies they utilized to tackle the reading problems and to develop understanding of what they read.

## CHAPTER III

### RESEARCH METHODOLOGY

This chapter which discusses research methodology is divided into six main parts. The first part presents the objectives of the study and research questions. In the second part, population and sampling procedure are described. The third part deals with the explanation of data collection method and procedures. Then, data analysis is discussed. The next one is the description of verification of the research method, and the ethical concerns of this study are explained in the last part.

#### Objectives of the Study and Research Questions

The objective of this study is to investigate the present needs for reading English for academic purposes of veterinary undergraduate students at Kasetsart University and problems confronted by those students when reading academic texts in English. This study also aims to explore English reading strategies utilized by the students. The goal of the study is to answer three main research questions: 1) To what extent do veterinary undergraduate students at Kasetsart University need to read English materials in their discipline?; 2) What are the important problems of the veterinary students when reading English materials in their discipline?; and 3) What are the strategies that the veterinary students use when reading English materials in their discipline?

#### Population and Sampling Procedure

The population in this study was 613 veterinary undergraduate students at Kasetsart University, ranging from the first year to the sixth year of study in the 2008 academic year. The total number of the students in each year of study was displayed in Table 1. First of all, the researcher used *probability stratified sampling* to classify the population. Cohen et al. (2000) explains that “stratified sampling” involves

dividing the population into homogenous groups, each group containing subjects with similar characteristics.” The population in this study was thus categorized into six groups: first, second, third, fourth, fifth, and sixth-year students.

According to the curriculum of the Faculty of Veterinary Medicine, the first-year students are generally required to study the basic subjects, e.g., general chemistry, general zoology, abridged physics, and introduction to veterinary medicine. Therefore, they had little opportunity to read English textbooks and other kinds of academic English materials.

In the second and third year of study, veterinary students are required to take the pre-clinic class which provides them with basic subjects in the field of veterinary medicine such as veterinary anatomy, veterinary histology, veterinary physiology, general pharmacology, and veterinary protozoology. The third-year students, however, have to take the seminar course which requires them to write up a seminar paper. Accordingly, they need to read various kinds of academic English materials including textbooks, research articles, and journals in order to complete the paper.

Besides, the fourth, fifth and sixth-year students have to take the post-clinic class which focuses on clinical practice at the veterinary hospital, clinic, and ranchland. This results in inconvenience to data collection.

In this study, the third-year students were considered the most appropriate to be the subjects. The total number of the third-year students was 108, consisting of 37 male students and 71 female students. Nevertheless, eight of them were excluded from the main study as they participated in the pilot study. The subjects finally totaled 100, comprising 35 male students and 65 female students.

To sum up, the course of Technical English which aims to practice the advanced reading skills should be offered to the third-year students in order that they are supplied with useful techniques or strategies for reading English texts in the future.

**Table 1** The total number of the veterinary students in the academic year 2008

<b>Year of Study</b>	<b>Male Students</b>	<b>Female Students</b>	<b>Total</b>
1	26	73	99
2	25	80	105
3	37	71	108
4	24	63	87
5	26	62	88
6	42	81	123
<b>Total</b>	<b>182</b>	<b>431</b>	<b>613</b>

Source: Faculty of Veterinary Medicine, Kasetsart University (2008)

### **Data Collection Methods and Procedures**

#### **The Methods Used in the Present Study**

This study was based on the combination of quantitative and qualitative approaches known as a mixed approach. Moore (2000: 121) indicates that ‘Quantitative research aims to show you what is happening. Qualitative research, on the other hand, sets out to tell you why it is happening.’ The approaches to gathering quantitative data are more structured and formal than the techniques used for collecting qualitative data (ibid.).

The researcher used two types of instruments, a questionnaire and interview, to gather data on the veterinary students’ needs and problems about reading academic materials in English and their use of reading strategies.

## **Questionnaire**

In this study, a quantitative approach was principally employed to obtain information about the veterinary students' needs and problems in English reading as well as their reading strategies. Wilkinson (2000) indicates that quantitative research is highly structured and produces data which are amenable to statistic analysis. The findings of quantitative research are thus presented in a numerical form. Methods of quantitative data collection consist of surveys, tests, structured interviews, laboratory experiments and non-participant observation (Cohen et al, 2000).

An instrument used to gather data from the subjects was a questionnaire. Johnson and Christensen (2000) define a questionnaire as a self-report data collection instrument that each participant can fill out. Questionnaires are employed to gain information about the thoughts, feelings, attitudes, beliefs, perceptions and intentions of research participants. Questionnaires are selected as the research instrument because they are relatively easy to administer and can be used to provide a wide range of data in various circumstances (Moore, 2000).

Kumar (2005) suggests that each questionnaire item needs to be clear and can be easily understood because nobody clarifies its meaning to respondents. In addition, the layout of a questionnaire should be easy to read and pleasant to the eyes and the sequence of questions should be easy to follow (ibid.). In this study, all questionnaire items were unambiguous and related to the research objectives and questions.

### **The Construction of the Questionnaire**

The following procedures were employed to construct and develop the questionnaire distributed to the subjects in this study. Firstly, many research studies concerned with English needs analysis were reviewed and various formats of questionnaires were examined to find a guideline for designing the questionnaire used in this study. Secondly, the researcher studied a number of research journals and textbooks on second language (L2) reading to obtain information on L2 reading

problems and strategies which were the main topics to be investigated in this study. Next, the researcher interviewed Dr. Kanjana Imsilp, a professor at the Faculty of Veterinary Medicine, Kasetsart University, and some of the third-year veterinary students in order to apply their responses to the development of questionnaire items. Based on the information gathered, the first draft of the questionnaire in English was constructed under the scope of the objectives of the study and the research questions. Furthermore, two need analysis instruments designed by Nunan and Lamb (1996) including *a survey of general learner needs* and *a language contact survey* were applied to the construction of the questionnaire. The researcher also developed the questionnaire based on the framework of target situation analysis in terms of necessities and lacks (Hutchinson and Waters, 1987). Then, the questionnaire was translated into Thai. The draft was checked and revised for face and content validity by the thesis advisor. A pilot study was also conducted to test the effectiveness of the questionnaire and to identify the ambiguity of the items before using it in the main study. The pilot study ensured that the subjects understood and interpreted the questions in the same way as the researcher expected. The researcher found some of the items vague and confusing. Therefore, unclear wording was clarified and useless items were eliminated to derive the final version.

The questionnaire used in this study comprised four main parts: veterinary students' background information, veterinary students' needs for reading academic materials in English, veterinary students' problems in reading academic materials in English, and veterinary students' use of English reading strategies.

### **Part 1 Veterinary Students' Background Information**

The first part of the questionnaire asked the subjects about their personal information regarding their age, gender, and duration of English learning. In addition, the subjects were asked about their taking an English course in reading before entering the university and while studying at the university.

## **Part 2 Veterinary Students' Needs Concerning Content of Academic English Materials**

This part was divided into two sections. The first one investigated the levels of needs for reading academic English materials of the subjects. The materials consisted of veterinary textbooks, textbooks of other disciplines, veterinary research articles, research articles of other disciplines, veterinary journals, journals of other disciplines, veterinary research reports, research reports of other disciplines, magazines, newspapers, and other materials specified by the subjects.

The second section explored the subjects' opinions on the purposes of reading academic English materials. The subjects read the materials to prepare for examinations, to gain information for doing a report, to gain information for conducting a seminar paper, to clarify some points that are difficult to understand, to obtain further knowledge, or for other purposes.

## **Part 3 Veterinary Students' Problems in Reading Academic English Materials**

The third part surveyed the subjects' problems in reading academic English materials. Twelve items of the reading problems were displayed in Appendix B.

## **Part 4 Veterinary Students' Use of English Reading Strategies**

The fourth part of the questionnaire concerned with the veterinary students' use of reading strategies included twenty-three items as shown in Appendix B.

In Parts 2, 3 and 4, the subjects had to specify their answers on a five-point Likert Scales as follows:

- 5 = Most
- 4 = A lot
- 3 = Moderate
- 2 = A little
- 1 = Least

The subjects were also allowed to express their opinions with regard to their problems in reading academic materials in English and reading strategies that they used in English reading at the end of the third and fourth parts of the questionnaire.

### **Interview**

Because the questionnaire survey may not enable the researcher to elicit detailed information from the subjects, the researcher also employed a qualitative approach so that the in-depth data of the subjects was discovered. The results of qualitative research are usually displayed in the form of quotations or descriptions (Wilkinson, 2000). A qualitative collection method utilized in this study to gain insight about their reading problems and strategies was an interview. Gray and Airasian (2000) point out that an interview is a purposeful interaction, normally between two people, which focuses on one person trying to get information from the other person. Interviewers can explore interviewees' responses to gather more in-depth data about their feelings and experiences. Interviews are categorized into four types: structured, semi-structured, unstructured and focus group interviews (Bryman, 1992).

In this study, a focus group interview was used as a data gathering tool. According to Kumar (2005), this type of interview aims to investigate the perceptions, experiences and understandings of a group of people who have some experience in common with regard to a situation or event. Johnson and Christensen (2000) remark that the focus groups interview is useful as a complement to other methods of data collection and can provide in-depth information in a relatively short period of time.

Before the interview, broad discussion topics were developed in accordance with the results derived from the questionnaire survey. The researcher non-randomly selected a group of three subjects composed of one female student and two male students, and asked them to read two copies of one-page excerpts from the different actual reading materials. One of them was supplied by the third-year veterinary student and the other was contributed by a veterinary professor. After that, the researcher initiated the discussion to seek the subjects' opinions on the problems in reading the given texts and reading strategies used to tackle them. The interview between the researcher and the subjects was recorded on an audiotape.

### Data Analysis

#### Questionnaire

The return rate of the questionnaire was 90%. The subjects' responses were analyzed by the computer program known as Statistical Package for Social Sciences (SPSS). The statistical devices used in the present study included frequency distribution, percentage (%), a five-point Likert scale, arithmetic mean ( $\bar{X}$ ), standard deviation (S.D.), and Cronbach's Alpha Coefficient. First, frequency distribution and percentage were used in the analysis of the responses concerning the subjects' general background. Second, a five-point Likert scale was used to score the levels of needs and problems in reading academic materials in English of the subjects and their use of reading strategies. The criteria for scoring were as follows:

Scale		Mean Range
5	Most	4.51 - 5.00
4	A lot	3.51 - 4.50
3	Moderate	2.51 - 3.50
2	A little	1.51 - 2.50
1	Least	1.00 - 1.50

The third devices were arithmetic mean ( $\bar{X}$ ) and standard deviation (S.D.). Mean was used to calculate the average level of needs and problems in reading English academic materials as well as the level of using reading strategies of the subjects. On the other hand, Standard deviation (S.D.) was a measure of the variability or dispersion, giving information on the extent to which a set of scores varied from the mean. Another device was Cronbach's Alpha Coefficient employed to ensure the consistency of the results obtained from the pilot study.

### **Interview**

The researcher used the following steps to analyze data. First of all, an audio recording of the interview was transformed into typed text. This involved typing the interview transcript into a word processing file. Next, the researcher read the transcribed data and segmented the data into meaningful analytical units. While reading the data, the researcher also produced reflective notes which recorded what was learned from it. After that, the data was organized into categories and then data interpretation was made. The last step was to validate the results in order to promote the trustworthiness of this research.

### **Verification of the Instrument**

### **Reliability**

The pilot of the questionnaire was conducted to check the content understanding of the subjects. The researcher used internal reliability to check the consistency of the results. The method used to measure internal consistency of the questionnaire was Cronbach's Alpha Coefficient method. The reliability coefficient of the questionnaire was .9233 which was accepted for social research with high reliability of 92.33%. In addition, the first draft of the interview questions which grounded on the quantitative results was revised and developed in consultation with the thesis advisor.

## **Validity**

The first draft of the questionnaire was based on relevant literature regarding needs analysis and L2 reading. Each of the questionnaire items on the scale had a logical link with the objectives of the study and covered all issues being measured. To ensure the validity of the questionnaire, the face and content were checked and revised under the supervision of the thesis advisor. The questionnaire was also tried out, in order to assure the validity of the instrument, with the veterinary students who were not included in the main study.

As well as the questionnaire, the questions used for the interview had a logical link with the research objectives in order to ensure the validity of the instrument. Furthermore, the findings were verified by the subjects known as member-checking which involves asking one or more participants to review the accuracy of the research report (Fraenkel et al., 2003).

## **Generalisability**

Data obtained from the questionnaire and interview was analyzed to identify the levels of the veterinary students' needs for reading academic English texts, their reading problems, and use of e generalized to the target population who was the veterinary undergraduate stureading strategies. Although the students from the first to sixth year of study have differences in the needs for academic English reading, the texts used in their discipline share things in common such as language, content, and organizations. For this reason, the results can bdenents at Kasetsart University.

## **Ethical Concerns**

In this study, both quantitative and qualitative approaches were employed to gain data from the subjects. The instruments for data gathering included the questionnaire survey and interview. Therefore, it was highly important to become

aware of ethical issues which comprised gaining access, informed consent, anonymity, confidentiality, correct reporting and information owner.

An authority's permission was one of the most important ethical issues. The researcher sent a formal letter to the Faculty of Veterinary Medicine, Kasetsart University, in order to request authorization for investigating veterinary students' opinions on needs and problems in reading English. The letter described the purposes and benefits of the research and how data was collected.

The subjects' consent was also necessary for conducting research. Before beginning the study, the subjects, or the third-year veterinary students, were informed about the research objectives, the methods and procedures for data collection and the benefits of the results.

Furthermore, anonymity was maintained. The personal information of the subjects such as names, addresses and educational level was not revealed to protect their privacy. Their names were replaced by codes, e.g., Miss A or Mr. B when references to specific data were made. The entire data was thus kept confidential.

When conducting the interview, the questions that tended to be private, sensitive and intrusive were not raised. Besides, the researcher considered possibilities of harming the subjects. The tone of voice and gestures of the researcher as the interviewer did not cause discomfort, harassment and anxiety to the interviewees.

Reporting the correct findings was another significant ethical concern. To guarantee the credibility of this study, the researcher never made any change or addition that might distort the findings. This can assure that data obtained from the survey is definitely precise.

The last issue to be discussed was information owner. This research was granted to the Graduate School and the Faculty of Humanities of Kasetsart University as a Master Degree Thesis and to the Faculty of Veterinary Medicine for the benefits of the curriculum design and development.



## CHAPTER IV

### RESULTS

This chapter represents the results obtained from the questionnaire survey and the interview. The survey findings are illustrated with tables which present the rating of the subjects in the form of frequency, percentage, mean, standard deviation, and meaning of the rating.

#### **Results Obtained from the Questionnaire**

The results are based on four main parts of the questionnaire as follows:

- 1) Veterinary students' background information
- 2) Veterinary students' needs concerning content of academic English materials
- 3) Veterinary students' problems in reading academic English materials
- 4) Veterinary students' use of English reading strategies

#### **Veterinary Students' Background Information**

The questionnaires were handed out to 100 third-year students from the Faculty of Veterinary Medicine, Kasetsart University. However, there were 90 students who returned the complete questionnaire. In this part, the subjects were requested to answer eight questions that covered general information about their age, gender, duration of English learning, and their taking the English course in reading before and after entering the university.

According to the survey, 62.2% of the subjects were female and 37.8% of them were male. A majority of subjects or 63.1% were at the age of 21, 22.6% were 20 years old, 11.9% were 22 years old, and only 1.2% were 23 years old. The findings

revealed that most subjects or 30% have been learning English for 15 years, followed by 15.6% who have been learning English for 17 years. Obviously, the percentage of the subjects who have been learning English for 10 and 12 years was equal, i.e. 12.2%. In addition, there were only 6.7% of the subjects that have been learning this language for 13 years.

The findings revealed that a great number of subjects (95.6%) have taken the English course in reading while studying at a secondary level. On the other hand, only 4.4% have never taken this course during their study at secondary school. In addition, 76.7% of the subjects have taken an extra tutorial class of English reading at other language institutes when they studied at a secondary level, whereas 23.3% have never had English reading tutorial while studying at secondary school.

The results also indicated that 52.2% and 44.4% of the subjects began with Foundation English III and Foundation English II at Kasetsart University respectively. Conversely, a few subjects or 2.2% began with English IV.

The subjects who have never taken any English course in reading when they studied at Kasetsart University were 58.9%, whereas 40% have taken an English course in reading at the university. Only 1.1% of the total subjects did not specify whether they have taken the English reading course. The course of Fundamental English Reading was taken by 77.8% of the subjects, followed by Reading for Mass Communication in English (16.7%) and Critical Reading and Writing in English (5.5%).

Furthermore, a vast majority of subjects or 83.3% have never taken a tutorial class of English reading at other language institutes during their university study, but 15.6% accepted that they have taken an extra course in English reading outside the university.

### Veterinary Students' Needs Concerning Content of Academic English Materials

This part was separated into two sections. The first section presented the subjects' opinions on needs for reading academic English materials such as textbooks, research articles, journals, and research reports. The other section reported the subjects' opinions on the purposes of reading academic English materials. The subjects were asked to rate their opinions on a five-point Likert scale. The criteria used for scoring were as follows:

Scale	Needs concerning content of academic English materials and purposes of reading academic English materials	Mean Range
5	Most	4.51 - 5.00
4	A lot	3.51 - 4.50
3	Moderate	2.52 - 3.50
2	A little	1.51 - 2.50
1	Least	1.00 - 1.50

The findings of this part are presented in the form of mean ( $\bar{X}$ ), standard deviation (S.D.), and the meaning of each response.

**Table 2** Veterinary Students' Needs Concerning Content of Academic English Materials

Items	$\bar{X}$	S.D.	Meaning
1. Veterinary textbooks	4.57	0.64	Most
2. Textbooks of other disciplines	3.36	0.99	Moderate
3. Veterinary research articles	4.31	0.80	A lot

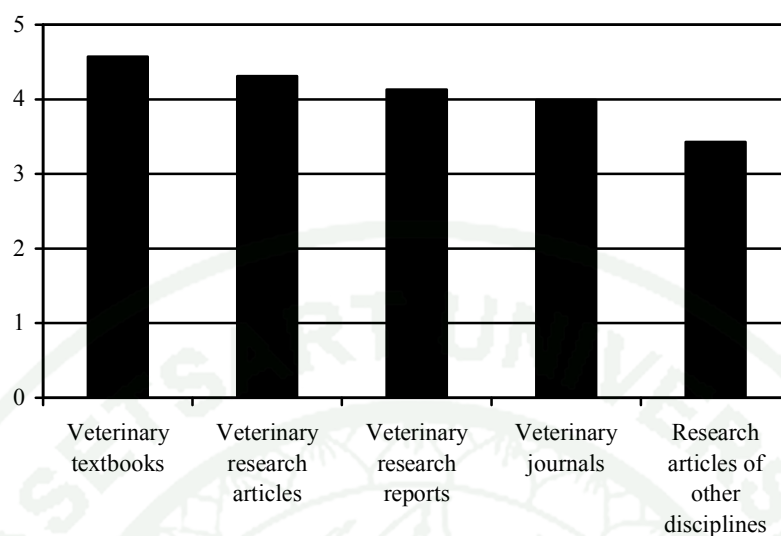
(n = 90)

**Table 2** (Continued)

(n=90)

Items	$\bar{X}$	S.D.	Meaning
4. Research articles of other disciplines	3.43	1.12	Moderate
5. Veterinary journals	3.99	0.87	A lot
6. Journals of other disciplines	3.31	1.10	Moderate
7. Veterinary research reports	4.13	0.80	A lot
8. Research reports of other disciplines	3.29	1.05	Moderate
9. Magazines	3.40	0.97	Moderate
10. Newspapers	3.33	1.05	Moderate
Average	3.71	0.94	A lot

From Table 2, it can be concluded that the subjects definitely needed to read many kinds of academic English materials. Veterinary textbooks were the materials that they needed to read most ( $\bar{X} = 4.57$ ). The subjects also had great needs for reading veterinary research articles ( $\bar{X} = 4.31$ ), veterinary research reports ( $\bar{X} = 4.13$ ), veterinary journals ( $\bar{X} = 3.99$ ) and research articles of other disciplines ( $\bar{X} = 3.43$ ) respectively. However, the materials of other disciplines were moderately necessary.



**Figure 3** Veterinary Students' Needs Concerning Content of Academic English Materials

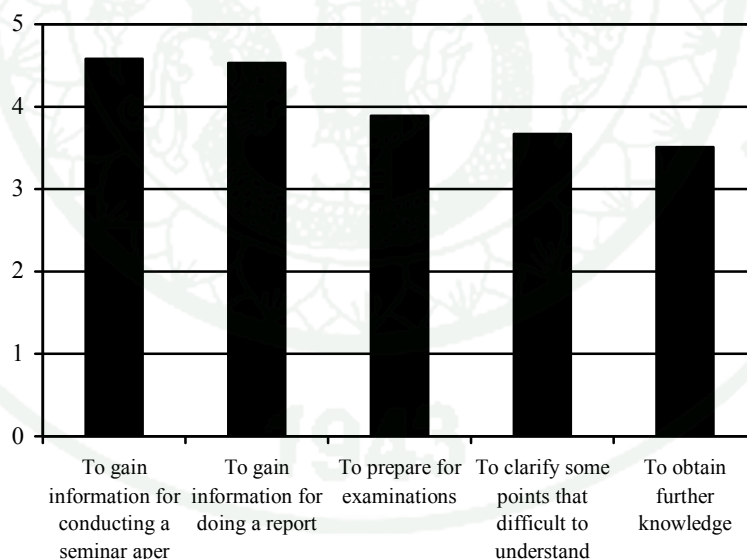
**Table 3** Veterinary Students' Purposes for Reading Academic English Materials

(n = 90)			
Items	$\bar{X}$	S.D.	Meaning
1. To prepare for examinations	3.89	0.92	A lot
2. To gain information for doing a report	4.53	0.60	Most
3. To gain information for conducting a seminar paper	4.58	0.58	Most
4. To clarify some points that are difficult to understand	3.67	0.99	A lot

**Table 3** (Continued)

(n = 90)			
Items	$\bar{X}$	S.D.	Meaning
5. To obtain further knowledge	3.51	0.96	A lot
Average	4.04	0.81	A lot

As can be seen from Table 3, the subjects greatly needed to read the academic English materials for various purposes. The most significant purposes were to gain information for conducting a seminar paper ( $\bar{X} = 4.58$ ) and to gain information for doing a report ( $\bar{X} = 4.53$ ). Moreover, they read the academic materials in order to prepare for examinations ( $\bar{X} = 3.89$ ), to clarify some points that are difficult to understand ( $\bar{X} = 3.67$ ), and to obtain further knowledge ( $\bar{X} = 3.51$ ) respectively.

**Figure 4** Veterinary Students' Purposes for Reading Academic English Materials

### Veterinary Students' Problems in Reading Academic English Materials

The third part was concerned with the subjects' problems in reading academic materials published in English. The subjects were asked to rate the level of their reading problems on a five-point Likert scale as follows:

Scale	Problems in reading academic English materials	Mean Range
5	Most	4.51 - 5.00
4	A lot	3.51 - 4.50
3	Moderate	2.51 - 3.50
2	A little	1.51 - 2.50
1	Least	1.00 - 1.50

**Table 4** Veterinary Students' Problems in Reading Academic English Materials

(n = 90)

Items	$\bar{X}$	S.D.	Meaning
1. Problems of general terms	3.92	0.90	A lot
2. Problems of technical terms	3.88	0.93	A lot
3. Problems in choosing the appropriate meaning	3.87	0.97	A lot
4. Problems of the complexity of English sentence structures	3.72	0.96	A lot
5. Problems in reading texts due to insufficient grammatical knowledge	3.38	1.04	Moderate

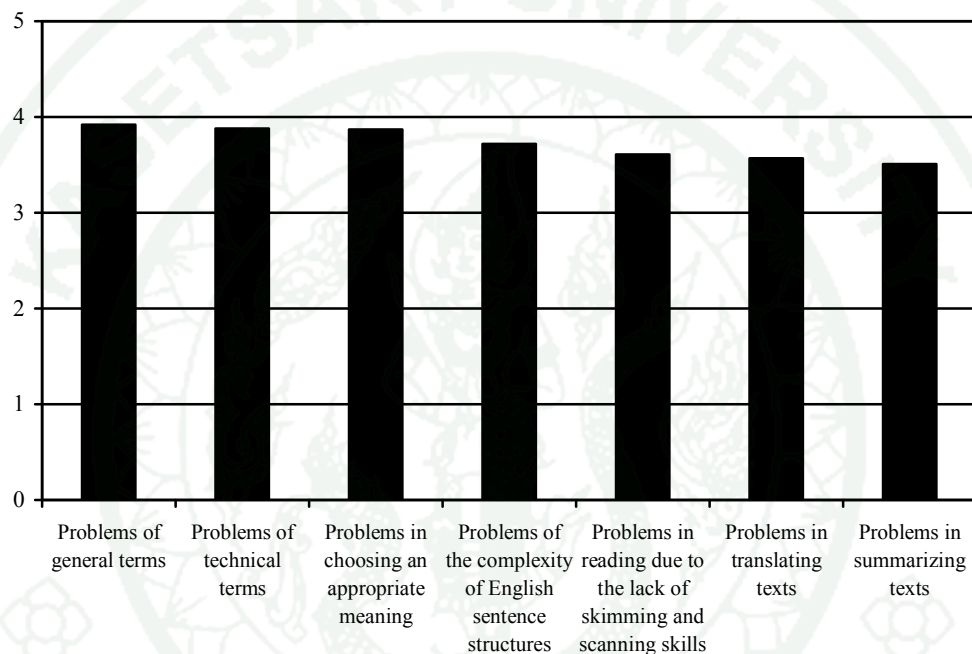
**Table 4** (Continued)

(n = 90)

Items	$\bar{X}$	S.D.	Meaning
6. Problems in reading texts due to the lack of skimming skill	3.61	1.07	A lot
7. Problems in reading texts due to the lack of scanning skill	3.61	0.91	A lot
8. Problems in identifying a main idea from texts	3.49	0.96	Moderate
9. Problems in translating texts	3.57	0.92	A lot
10. Problems in summarizing texts	3.51	0.89	A lot
11. Problems in ordering the sequence of information	3.42	0.94	Moderate
12. Problems in identifying between fact and a writer's opinion	3.39	1.05	Moderate
Average	3.61	0.96	A lot

As shown in Table 4, it can be seen that the subjects had problems at a high level ( $\bar{X} = 3.61$ ) when they read academic English materials. The eight major problems in reading English texts included problems of general terms ( $\bar{X} = 3.92$ ), problems of technical terms ( $\bar{X} = 3.88$ ), problems in choosing the appropriate meaning ( $\bar{X} = 3.87$ ), problems of the complexity of English sentence structures ( $\bar{X} = 3.72$ ), problems in reading texts due to the lack of skimming skill and problems in reading texts due to the lack of scanning skill ( $\bar{X} = 3.61$ ), problems in translating texts ( $\bar{X} = 3.57$ ), and problems in summarizing texts ( $\bar{X} = 3.51$ ) respectively.

The survey also pointed out that the subjects moderately confronted with problems in identifying a main idea from texts ( $\bar{X} = 3.49$ ), problems in ordering the sequence of information ( $\bar{X} = 3.42$ ), problems in identifying between fact and a writer's opinion ( $\bar{X} = 3.39$ ), and problems in reading texts due to insufficient grammatical knowledge ( $\bar{X} = 3.38$ )



**Figure 5** Veterinary Students' Problems in Reading Academic English Materials

### Veterinary Students' Use of English Reading Strategies

This part aims to survey the strategies for academic reading used by the subjects. They had to show their opinions by rating the items on a five-point Likert scale as follows:

Scale	Use of strategies for reading academic English materials	Mean Range
5	Most	4.51 - 5.00
4	A lot	3.51 - 4.50
3	Moderate	2.51 - 3.50
2	A little	1.51 - 2.50
1	Least	1.00 - 1.50

**Table 5** Veterinary Students' Use of English Reading Strategies

(n = 90)

Items	$\bar{X}$	S.D.	Meaning
1. Setting a purpose for reading	3.62	0.80	A lot
2. Using prior knowledge to enhance text comprehension	3.84	0.81	A lot
3. Previewing the text to see what it is about before reading	3.44	0.90	Moderate
4. Checking whether text content fits a reading purpose	3.76	0.80	A lot
5. Skimming to note text organizations	3.72	0.75	A lot
6. Using text features (e.g. tables, graphs, diagrams) to increase understanding	3.67	0.85	A lot

**Table 5** (Continued)

(n = 90)

Items	$\bar{X}$	S.D.	Meaning
7. Using typographical aids (e.g. italics, boldface) to identify key information	3.64	0.88	A lot
8. Predicting what the text is about	3.61	0.76	A lot
9. Checking if prediction about the text is right or wrong	3.44	0.80	Moderate
10. Checking understanding when conflicting information is come across	3.48	0.80	Moderate
11. Reading slowly and carefully	3.58	0.82	A lot
12. Trying to stay focused on reading	3.57	0.82	A lot
13. Adjusting reading rate according to what is read	3.71	0.81	A lot
14. Pausing and thinking about what is read	3.56	0.94	A lot
15. Critically evaluating the information presented in the text	3.68	0.75	A lot
16. Re-reading for better understanding when the text becomes difficult	3.76	0.81	A lot
17. Guessing the meaning of unknown words from the context	3.91	0.74	A lot
18. Reading aloud when the text becomes hard	3.13	1.01	Moderate

**Table 5** (Continued)

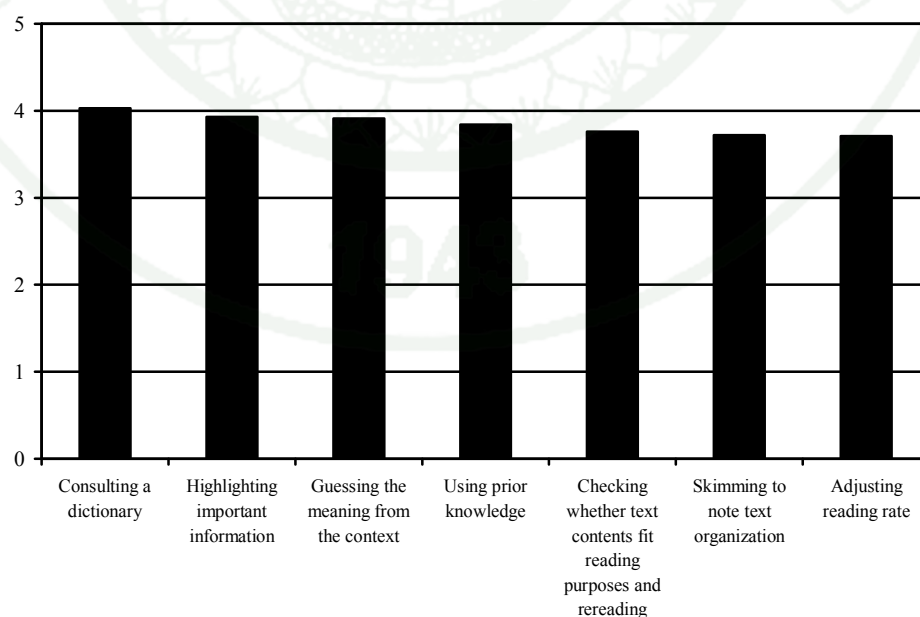
(n = 90)

Items	$\bar{X}$	S.D.	Meaning
19. Consulting a dictionary to look up the meanings of unknown words	4.03	0.95	A lot
20. Taking notes while reading	3.31	0.91	Moderate
21. Highlighting important information by underlining or using highlighters to help remember it	3.93	0.89	A lot
22. Summarizing what is read to reflect on important information in the text	3.49	0.96	Moderate
23. Discussing what is read with others e.g. lecturers and classmates to check understanding	3.54	0.77	A lot
Average	3.63	0.84	A lot

Table 5 showed that twenty-three strategies were highly employed by the subjects ( $\bar{X} = 3.63$ ). The findings revealed that consulting a dictionary to look up the meanings of unknown words ( $\bar{X} = 4.03$ ) was the most frequent reading strategy, followed by highlighting important information by underlining or using highlighters to help remember it ( $\bar{X} = 3.93$ ), guessing the meanings of unknown words from the context ( $\bar{X} = 3.91$ ), using prior knowledge to enhance text comprehension ( $\bar{X} = 3.84$ ), checking whether text content fits reading purposes and re-reading for better understanding when the text becomes difficult ( $\bar{X} = 3.76$ ), skimming to note text organizations ( $\bar{X} = 3.72$ ), and adjusting reading rate according to what is read ( $\bar{X} = 3.71$ ).

Apart from the strategies mentioned above, the subjects used other strategies to improve their reading comprehension. Those strategies consisted of critically evaluating the information presented in the text ( $\bar{X} = 3.68$ ), using text features e.g. tables, graphs, diagrams to increase understanding ( $\bar{X} = 3.67$ ), using typographical aids e.g. italics, boldface to identify key information ( $\bar{X} = 3.64$ ), setting a purpose for reading ( $\bar{X} = 3.62$ ), predicting what the text is about ( $\bar{X} = 3.61$ ), reading slowly and carefully ( $\bar{X} = 3.58$ ), trying to stay focused on reading ( $\bar{X} = 3.57$ ), pausing and thinking about what is read ( $\bar{X} = 3.56$ ), and discussing what is read with others such as lecturers and classmates to check understanding ( $\bar{X} = 3.54$ ).

To enhance text comprehension, the following strategies were also used at a moderate level: summarizing what is read to reflect on important information in the text ( $\bar{X} = 3.49$ ), checking understanding when conflicting information is come across ( $\bar{X} = 3.48$ ), previewing the text to see what it is about before reading and checking if prediction about the text is right or wrong ( $\bar{X} = 3.44$ ), taking notes while reading ( $\bar{X} = 3.31$ ), and reading aloud when text becomes hard ( $\bar{X} = 3.13$ ).



**Figure 6** Veterinary Students' Use of English Reading Strategies

## **Results Obtained from the Interview**

The researcher conducted the semi-structured interview with three volunteer subjects who included one female and two males. The interview provided the further results of their needs for reading academic texts, problems in English reading and use of reading strategies.

### **Needs for Reading Academic English Materials**

According to the interview, the subjects needed to read reports, journals, textbooks and research abstracts in veterinary medicine. The main purposes for reading these academic materials were to do reports, to obtain further knowledge and to deepen understanding of the lessons.

The subjects also remarked that they needed to learn general vocabulary and technical terms, English grammar and English sentence structures, and to have background knowledge of the texts. This would facilitate their independent study and help them improve reading speed as well as enhance reading comprehension.

### **Problems in Reading Academic English Materials**

The subjects were first asked to read two copies of one-page excerpts from different texts. The researcher then made a discussion of their problems in reading the given excerpts and the strategies they used for reading.

The results demonstrated that the subjects usually experienced a lexical problem, i.e., they were not able to interpret unfamiliar general vocabulary. Conversely, they hardly had a problem with technical terms which were generally taught in the class. Furthermore, the subjects commonly encountered difficulties in

the complexity of a sentence. Both complex sentence and compound complex sentence were the most problematic for them.

### **Use of English Reading Strategies**

The strategy that the subjects mostly employed to find the meanings of unfamiliar general words was to consult a dictionary. In case of words with various meanings, the subjects used the linguistic context to determine the most appropriate meaning. Without a dictionary, the subjects identified vocabulary meanings by guessing them from the context. Nonetheless, this technique was applicable when they knew the meanings of other words. Another strategy for finding the meanings was to skip the sentence containing unknown words and read the following sentence to interpret the previous one.

Regarding the complexity of a sentence structure, the subjects used several strategies to cope with complex sentences. One important strategy was to separate embedded clauses from the sentence in order to identify the bare structure. In addition, the subjects translated complex sentences from English into Thai so that they were easier to be understood. The other strategies were to pay close attention to reading the complex sentences and to reread when the sentences were difficult.

The subjects also claimed that using background knowledge was a beneficial reading strategy. Two subjects stated that background knowledge was able to help them guess the meanings of unknown words and enhance reading comprehension. Similarly, the other subject remarked that reading the texts relating to what was acquired assisted the readers in reviewing their prior knowledge.

To improve their understanding of what they read, the subjects circled key words in the texts and underlined important information. They also used short words to sum up what each paragraph was about.

Furthermore, the subjects had different techniques for evaluating their reading comprehension. The female subject summarized the main idea of the texts in Thai whereas one of two male subjects explained to himself about what he read. On the other hand, another male subject checked how much he was able to apply the texts to his study.

Two male subjects revealed that the strategies they used for English reading were ineffective. The reason for this was that they were unable to comprehend the entire texts. Nevertheless, the female subject considered that her strategies were effective because she was able to understand the texts and to summarize them in Thai.

The subjects reported that they greatly needed to develop their English reading skills. This was because most academic texts tended to be more available in English. Efficient reading skills might be applied to their study and help them save time reading.

This chapter presents the results of the study derived from the questionnaire survey and interview. The next chapter will discuss the findings, implication of the study, recommendations of further studies and the conclusion of the thesis.

## **CHAPTER V**

### **DISCUSSION**

This chapter presents a discussion of the findings with regard to needs and problems in reading English academic texts of veterinary undergraduate students at Kasetsart University and the strategies that they used to tackle their reading problems. The findings will be interpreted and discussed in line with the research objectives and questions. This chapter covers four main parts which include discussions of research findings, implications of this study, recommendations for further studies, and conclusion of the study.

#### **Discussions of Research Findings**

The objective of this study is to investigate the needs and problems in reading academic English materials of veterinary undergraduate students at Kasetsart University and strategies which help them understand what they read. This study is conducted to answer the following research questions.

1. To what extent do veterinary undergraduate students at Kasetsart University need to read English materials of their discipline?
2. What are the important problems of the veterinary students when reading English materials of their discipline?
3. What are the strategies that the veterinary students use when reading English materials of their discipline?

### **Veterinary Students' Needs Concerning Content of Academic English Materials**

In the present study, a vast majority of the subjects was female, and most of them were 21 years old. One-third of the subjects have been learning English for 15 years. Nearly all the subjects have taken the English course in reading when they studied at a secondary school. More than half of the subjects have had English reading tutorial at other language institutes during their study at a secondary level. The first English course taken by half of the subjects at Kasetsart University was Foundation English III. While studying at the university, a minority of subjects have taken English courses in reading which comprise Fundamental English Reading, Reading for Mass Communications in English, and Critical Reading and Writing in English. Besides this, a large number of subjects have never taken a tutorial course in English reading at other language institutes during their university study.

According to the questionnaire survey, the subjects highly needed to read various types of English materials relevant to their discipline which consisted of textbooks, research articles, research journals, and research reports. The interview results also showed that the subjects had needs for reading reports, journals, textbooks and research abstracts in veterinary medicine. These are in accord with Lewis and Reinder (2003) who states that reading materials for university students are textbooks, journals, articles, research reports, and theses.

The findings from both data collection instruments demonstrated that the subjects were required for reading English academic materials to achieve many academic purposes. The crucial purposes were to gain information for conducting a seminar paper, to gain information for doing a report, to prepare for examinations, to clarify some points that are difficult to understand, to increase understanding of the lessons and to acquire further knowledge. Thawut (1996) suggests that specific purposes in reading will determine approaches to reading, reading strategies, and the type of written texts they will use. Consequently, different reading purposes may lead to differences in the use of strategies for reading texts.

### **Veterinary Students' Problems in Reading Academic English Materials**

Based on the survey results, the subjects encountered many problems while reading academic English texts. The most serious problem was that they did not know the meanings of general terms, whereas the secondary problem was they did not understand technical terms. Similarly, the interview pointed out that the subjects confronted the problem in interpreting general terms which included verbs, adjectives, adverbs and conjunctions, and they had a little problem with technical terms.

These findings are compatible with those of research carried out by Levine and Reves (1990 cited in Anderson, 1999) which found general words more difficult for the reader than special terminology. Anyhow, these two problems indicate that the subjects have inadequate vocabulary storage. Anderson (1999) remarks that vocabulary deficiency is considered one of difficulties in comprehending texts and also emphasizes that vocabulary plays a major role in predicting overall reading ability.

Another serious problem was a selection of an appropriate meaning. This is because one word may possess several meanings. Nuttall (1996) affirms that words with more than one meaning can cause potential trouble. In addition, misunderstanding possibly occurs when everyday words are used in specialized fields. For example, *argument* used by a mathematician is quite different from that of a statistician.

In addition, the results of both questionnaire survey and interview suggested that the subjects were faced with problems in reading English academic texts due to the complexity of English sentence structures. This is related to Nuttall (1996) who claims that the complex syntax of long sentences can bring about comprehension blockade although the reader can interpret every word.

Lack of skimming and scanning skills was also one of the important causes which affected the subjects' reading comprehension. Skimming is defined by Meckhayai (1992) as a reading technique used to rapidly survey the general content of a text, how the text is organized, and the intention of the writer, whereas scanning refers to a reading technique used to find specific information quickly. Both skimming and scanning can help the readers obtain information they need in a limited time. These two techniques are thus necessary for quick and efficient reading.

On the contrary, it appears that the subjects occasionally had grammatical problems when they read English texts. The reason for this is that the English curriculum offered by most schools in Thailand generally emphasizes the instruction of grammar. Accordingly, English grammar may not be a main obstacle for the subjects who have learned English in Thailand school.

#### **Veterinary students' use of English reading strategies**

The results gained from the questionnaire survey and the interview indicated that the subjects used various reading strategies to increase their comprehension of the text. The most frequent strategy was to consult a dictionary in order to look up the meanings of unfamiliar words. According to Meckhayai (1992), a dictionary is the most valuable tool for serious readers who need to read textbooks, reference works, or other materials containing technical language and other kinds of difficult vocabulary. However, the subjects' frequent use of this strategy is incompatible with the results concerning their problems in English reading. The findings demonstrated that most subjects confronted the problems in interpreting general and technical terms even though they usually find word meanings from the dictionary. This can be assumed that the students might not know how to use this tool effectively.

In case words covered various meanings, the subjects used the linguistic context to select the appropriate meaning. To tackle this problem, Nuttall (1996) suggests that the readers need to use common sense in deciding whether to accept a familiar meaning or check whether another is possible.

One important strategy used by the subjects to reduce lexical problems was to guess the meaning of unknown words from the context. Since English is not the subjects' native language, it is certain that they usually have difficulties in comprehending academic texts containing unfamiliar English words. Anderson, (1999) suggests that the basic strategy for new vocabulary acquisition is to use the context as a clue to word meanings. Nevertheless, the subjects might be unable to infer the meanings of all technical terms and some kind of difficult vocabulary from the context. For this reason, dictionaries appear to be an effective tool for acquiring the meanings of unknown words.

Concerning the simplification of complex sentences, the subjects separated embedded clauses from the sentence in order to clarify the main structure. This conforms to the technique of Nuttall (1996) who proposes that the optional parts of the sentences must be removed so that the bare structure is clear. After that, the optional elements can be restored to the structure in order to make sense of the entire sentence.

It can be seen that highlighting important information was one of the useful reading strategies utilized by the subjects. They generally underlined the key information or distinguished it with highlighters to enhance their memorization. Besides, they circled key words in the texts and employed short words to brief what each paragraph was about. These techniques can help them increase their text comprehension and find what they need in the texts more quickly.

Using prior knowledge was another necessary strategy that the subjects used to acquire the deep understanding of text meaning. Carrell and Eisterhold (1988: 76) claims that 'efficient comprehension requires the ability to relate the textual material to one's own knowledge.' Background knowledge includes life experiences, educational experiences, knowledge of how texts can be organized rhetorically, knowledge of how one's first language works, knowledge of how the second language works, cultural background, and knowledge of the content area of a text (Anderson,

1999). Thus, the activation of prior knowledge can assist L2 readers in improving their reading comprehension.

When the text becomes difficult, the subjects also re-read it for better understanding. It would appear that reading is repeated to clarify some ambiguous points or to assure that their understanding is correct. The result is related to the study of Sheorey and Mokhtari (2001) which revealed ESL students frequently used this strategy to clarify ambiguous points and to correct their understanding.

Furthermore, the subjects frequently checked whether text content fits reading purposes or not. This indicates that they set a definite purpose in reading. They probably read a text to prepare for the test, to obtain further knowledge, or to find some information that might be useful for their report. Having a clear purpose in mind will help the reader decide which part of the text is irrelevant and can be skimmed over quickly, and which part is relevant and have to be studied in detail (Meckhayai, 1992).

In contrast, the least frequent strategy was to read aloud when the texts becomes difficult. It is possible that the subjects hardly read the difficult texts loudly because they did not learn how words contained in the texts were pronounced. This indicates that inability to pronounce words correctly can cause problems in reading and comprehending English texts.

### **Implications of this Study**

This study was conducted to investigate the needs for reading English academic materials of veterinary undergraduate students at Kasetsart University and the problems in academic reading that they were confronted with. In addition, this study aimed to probe their reading strategies used to cope with the problems and to facilitate their comprehension. The results of this study regarding needs and problems in English reading as well as reading strategies serve as useful guidelines for

designing the English course in academic reading which meets the veterinary students' actual needs.

### **1. Designing teaching methods**

The problems in English reading found in this study provide course designers with beneficial suggestions for designing methods for teaching how to read in English. At the beginning of the reading course, the KU veterinary students should be equipped with instruction of academic terms and technical terms in veterinary medicine as well as grammatical knowledge. The methods used to help the students practice reading skills should be learner-centered. Classroom activities may include pair and group works, discussion on reading texts, and group presentations. The learner-centered teaching methods will encourage the students to have self-study, analyze the texts, and discuss what they have read.

### **2. Designing reading materials**

Reading materials are another key element of an approach to L2 reading teaching. Appropriate materials will lead learners to success in learning how to read in a second language effectively. The results of this study pointed out that veterinary students at Kasetsart University definitely needed to read a variety of English materials of their discipline such as textbooks, research articles, research journals, and research reports. In order to facilitate the students' learning process, reading materials should thus contain authentic texts drawn from many kinds of materials. Thereby, the students can develop their own reading strategies to cope with different types of texts independently.

### **3. Course Content**

According to the results of this study, the veterinary students mostly read English materials of their discipline to write up a seminar paper and a report. The focus should thus be on the instruction of skimming and scanning, identifying topic

sentences and main ideas, finding word meanings from a dictionary and guessing them from the context as well as translating texts from English into Thai. To facilitate preparation for an exam, L2 reading teachers should also provide the students with other techniques such as SQ3R, consisting of survey, question, read, recall, and revise. This technique can aid them in enhancing text comprehension and remembrance.

Based on difficulties in English reading of the veterinary students, the course content should aim at the cultivation of vocabulary used in academic texts and veterinary terms. The teachers should also supply vocabulary learning strategies so that the students can guess word meanings without consulting a dictionary. Furthermore, the students should be educated on English sentence structures which became one of the key reading comprehension barriers for them.

Despite the frequent use of a dictionary, the veterinary students confronted problems in understanding general and technical terms, and in choosing appropriate meanings. Consequently, they should be taught how to make effective use of the dictionary so that they can look up words meanings faster, and obtain the meanings suitable for the context.

Additionally, the findings suggested that the veterinary students hardly read aloud when the texts were difficult. It is possible that the students do not learn how words contained in the texts were pronounced. Therefore, the reading course to be designed for them may provide the instruction of pronunciation in English.

### **Recommendations for Further Studies**

The present study was carried out to investigate the needs and problems in academic reading of veterinary undergraduate students at Kasetsart University and the strategies they used to develop their reading comprehension. Hence, there should be a parallel study which investigates difficulties in English reading and reading strategies

of veterinary undergraduate students at other universities in Thailand. This can lead to a comparison between the findings of this study and those of other similar studies.

Additionally, further research should be conducted to probe the problems in reading English academic texts and reading strategies of undergraduate students from other disciplines such as engineering, nursing science, medical science, pharmacy etc. The findings may reflect the opinions on the L2 reading problems and strategies of students in different branches. This will be definitely advantageous to L2 reading teachers to prepare lesson plans which serve the actual needs of students in different areas.

Furthermore, it is interesting to conduct a comparative study on difficulties in English reading of Thai undergraduate students at public and private universities. The study possibly reveals different results concerning those students' reading problems and their solutions. This can help English reading teachers prepare reading materials which meet the students' demands and provide suitable strategies to alleviate the problems.

This study intends to examine needs and problems about academic English reading of KU veterinary students, and the strategies they used to tackle the problems. Accordingly, further studies should aim at the students' wants and attitudes towards improvement of English reading skills. This will be advantageous to the construction of an English course in reading.

To gain in-depth data from the participants, further research should also focus on the use of qualitative methods of data collection such as interview and observation. Through these two methods, the researchers can elicit their participants' thoughts and feelings towards difficulties in L2 reading and also observe the strategies that they actually use while reading English materials.

### **Conclusion of the thesis**

This study aimed to explore the needs and problems in reading English academic materials of veterinary undergraduate students at Kasetsart University and the strategies that the students use while reading. The subjects were 100 third-year veterinary students at Kasetsart University. The data were collected by means of a questionnaire and group interview. The questionnaire was divided into four main parts which investigate the students' background information, their needs and problems in reading English academic texts, and the use of their reading strategies. The statistical techniques were used to analyze the data obtained from the questionnaire survey. On the other hand, the interview questions were based on the research objectives and covered the topics being investigated.

The findings revealed that reading academic materials in English was highly necessary for the veterinary students at Kasetsart University. They mostly read textbooks, research articles, research journals, and research reports of their discipline. The purposes of reading these materials were to gain information for conducting a seminar paper and for doing a report, to prepare for examinations, to clarify some points that are difficult to understand, and to gain further knowledge respectively.

The veterinary students' most serious problem in reading English academic materials was that they did not know the meanings of general terms, followed by problems of technical terms, problems in assigning an appropriate meaning to a word, problems about the complexity of English sentence structures, and lack of skimming and scanning skills. On the contrary, knowledge of English grammar became the least problematic for them.

The survey findings indicated that the students utilized different strategies to tackle the difficulties in reading English materials. The most frequent strategy was to consult a dictionary when unfamiliar words are found. Also, they frequently used other strategies, namely highlighting important information by underlining or using highlighters, using prior knowledge, guessing the meanings of unknown words from

the context, checking how text content fit purposes, and re-reading for better understanding. The least frequent strategy was to read aloud when text becomes hard. Moreover, the interview showed that most subjects dealt with the complex sentences by removing the embedded clauses from the sentences in order to identify the main structures.

The results of the present study may contribute to the development of an English course in academic reading for veterinary students at Kasetsart University. Furthermore, this study provides course designers with information useful for developing methods of teaching and designing teaching materials which serve the students' needs and assists a teacher of English reading in preparing an appropriate lesson plans.

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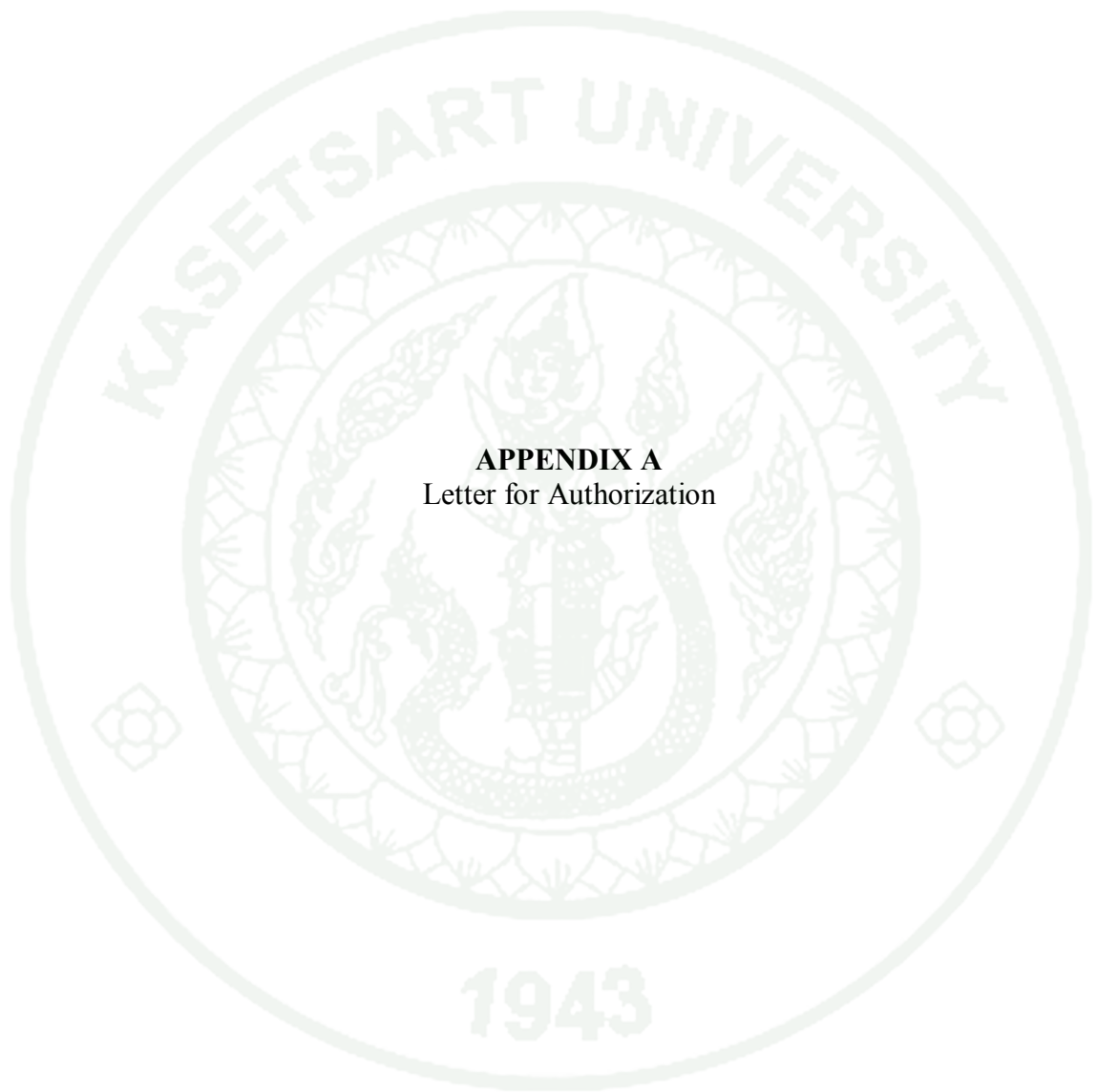
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**APPENDICES**



**APPENDIX A**  
Letter for Authorization



## บันทึกข้อความ

ส่วนราชการ บัณฑิตวิทยาลัย อาคารสารสนเทศ โทร. 0-2942-8445-9 ภายใน 1184-7 ต่อ 210

ที่ ศธ 0513.11501/ 0436

วันที่ 24 กุมภาพันธ์ 2552

เรื่อง ขอความอนุเคราะห์ในการเก็บข้อมูลวิจัยประกอบการทำวิทยานิพนธ์

เรียน คณบดีคณะสัตวแพทยศาสตร์

สิ่งที่ส่งมาด้วย แบบสอบถามเพื่อการวิจัย

ด้วย นางสาวธัญชนก หล่ออนาคต นิสิตระดับปริญญาโท สาขาวิชาภาษาอังกฤษเพื่อวัตถุประสงค์เฉพาะ ภาควิชาภาษาต่างประเทศ เข้าศึกษาในบัณฑิตวิทยาลัย มหาวิทยาลัยเกษตรศาสตร์ ให้ทำวิทยานิพนธ์เรื่อง “Needs and Problems about Academic English Reading of Veterinary Undergraduate Students at Kasetsart University” ภายใต้การควบคุมของผู้ช่วยศาสตราจารย์ ดร. พรศิริ ม่วงสมัย อาจารย์ที่ปรึกษาวิทยานิพนธ์หลัก

การวิจัยครั้งนี้ นิสิตจำเป็นต้องรวบรวมข้อมูลวิจัยประกอบการทำวิทยานิพนธ์ จึงขอความอนุเคราะห์จากท่านในการเก็บข้อมูลความจำเป็นและปัญหาในการอ่านภาษาอังกฤษเพื่อการศึกษาของนิสิตปริญญาตรี จากนิสิตนักศึกษาโดยแบบสอบถาม เพื่อประกอบการเรียบเรียงวิทยานิพนธ์ให้สมบูรณ์ยิ่งขึ้น

จึงเรียนมาเพื่อโปรดให้ความอนุเคราะห์แก่ นางสาวธัญชนก หล่ออนาคต สามารถติดต่อได้ที่หมายเลขโทรศัพท์ 089-782-4715 และขอขอบคุณ มา ณ ที่นี้

(รองศาสตราจารย์ ดร. กัญญา ชีระกุล)

คณบดีบัณฑิตวิทยาลัย



**Appendix B**  
Questionnaire in English

## QUESTIONNAIRE

### Needs and Problems about Academic English Reading of Veterinary Undergraduate Students at Kasetsart University

#### Objectives of the Study

1. To investigate needs for reading academic English materials of veterinary undergraduate students at Kasetsart University
2. To investigate problems in reading academic English materials of veterinary undergraduate students at Kasetsart University
3. To investigate strategies that veterinary undergraduate students at Kasetsart University use when reading academic English materials

**Instruction: This questionnaire is divided into four parts.**

**Part 1:** Veterinary Students' Background Information

**Part 2:** Veterinary Students' Needs Concerning Content of Academic English Materials

**Part 3:** Veterinary Students' Problems in Reading Academic English Materials

**Part 4:** Veterinary Students' Use of English Reading Strategies

**Part 1: Veterinary Students' Background Information**

Please fill in the blanks provided and put ✓ in the appropriate box.

1. Gender:  Male  Female
  
2. Age: \_\_\_\_\_
  
3. How many years have you been learning English? \_\_\_\_\_
  
4. Have you ever taken the English course in reading while studying at a secondary level?  
 Yes  No
  
5. Have you ever taken an extra course in English reading at other language institutes while studying at a secondary level?  
 Yes  No
  
6. Which level of Foundation English did you begin at Kasetsart University?  
 Foundation English I  Foundation English II  
 Foundation English III  Others (please specify) \_\_\_\_\_
  
7. Have you ever taken any English course in reading while studying at Kasetsart University?  
 Yes  No

If yes, which course did you take?

- Fundamental English Reading
- Reading for Mass Communications in English
- Critical Reading and Writing in English
- Others (please specify)\_\_\_\_\_

8. Have you ever taken any extra course in English reading at other language institutes while studying at Kasetsart University?

- Yes  No

**Part 2: Veterinary Students' Needs Concerning Content of Academic English Materials**

Please indicate your opinions towards the following items by marking ✓ in the box. The criteria are as follows:

- 5 = Most**
- 4 = A lot**
- 3 = Moderate**
- 2 = A little**
- 1 = Least**

To what extent do you need to read the following academic English materials?

Items	Level				
	5	4	3	2	1
1. veterinary textbooks					
2. textbooks of other disciplines					

Items	Levels				
	5	4	3	2	1
3. veterinary research articles					
4. research articles of other disciplines					
5. veterinary journals					
6. journals of other disciplines					
7. veterinary research reports					
8. research reports of other disciplines					
9. magazines					
10. newspapers					
11. Others (please specify)_____					

**For what purposes do you read academic English materials mentioned above?**

Items	Level				
	5	4	3	2	1
1. To prepare for examinations					
2. To gain information for doing a report					
3. To gain information for conducting a seminar paper					
4. To clarify some points that are difficult to understand					
5. To gain further knowledge					
6. Others (please specify)_____					

### Part 3: Veterinary Students' Problems in Reading Academic English Materials

Please indicate your opinions towards the following items by marking ✓ in the box. The criteria are as follows:

5 = Most

4 = A lot

3 = Moderate

2 = A little

1 = Least

To what extent do you have the following problems in reading academic English materials?

Items	Level				
	5	4	3	2	1
1. Problems of general terms					
2. Problems of technical terms					
3. Problems in choosing the appropriate meaning					
4. Problems of the complexity of English sentence structures					
5. Problems in reading texts due to insufficient grammatical knowledge					
6. Problems in reading texts due to the lack of skimming skill					
7. Problems in reading texts due to the lack of scanning skill					

Items	Level				
	5	4	3	2	1
8. Problems in identifying a main idea from texts					
9. Problems in translating texts					
10. Problems in summarizing texts					
11. Problems in ordering the sequence of information					
12. Problems in identifying between fact and a writer's opinion					

If you have any other problems, please specify.

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#### Part 4: Veterinary Students' Use of English Reading Strategies

Please indicate your opinions towards the following items by marking ✓ in the box. The criteria are as follows:

**5 = Most**

**4 = A lot**

**3 = Moderate**

**2 = A little**

**1 = Least**

**To what extent do you use the following reading strategies?**

Items	Level				
	5	4	3	2	1
1. Setting a purpose for reading					
2. Using your prior knowledge to enhance text comprehension					
3. Previewing the text to see what it is about before reading					
4. Checking whether text content fits a reading purpose					
5. Skimming to note text organizations					
6. Using text features (e.g. tables, graphs, diagrams) to increase your understanding					
7. Using typographical aids (e.g. italics, boldface) to identify key information					
8. Predicting what the text is about					
9. Checking if your prediction about the text is right or wrong					
10. Checking your understanding when conflicting information is come across					
11. Reading slowly and carefully					
12. Trying to stay focused on reading					
13. Adjusting reading rate according to what is read					

Items	Level				
	5	4	3	2	1
14. Pausing and thinking about what is read					
15. Critically evaluating the information presented in the text					
16. Re-reading for better understanding when the text becomes difficult					
17. Guessing the meaning of unknown words from the context					
18. Reading aloud when text becomes hard					
19. Consult a dictionary to look up the meanings of unknown words					
20. Taking notes while reading					
21. Highlighting important information by underlining or using highlighters to help you remember it					
22. Summarizing what you read to reflect on important information in the text					
23. Discussing what you read with others e.g. lecturers and classmates to check your understanding					

If you use any other strategies, please specify.

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**APPENDIX C**  
Questionnaire in Thai

### แบบสอบถาม

เรื่อง ความจำเป็นและปัญหาในการอ่านภาษาอังกฤษเพื่อการศึกษาของ  
นิสิตปริญญาตรีคณะสัตวแพทย์ มหาวิทยาลัยเกษตรศาสตร์

#### วัตถุประสงค์ของการวิจัย

1. เพื่อสำรวจความจำเป็นในการอ่านเอกสารทางวิชาการภาษาอังกฤษของนิสิตปริญญาตรีคณะสัตวแพทย์ มหาวิทยาลัยเกษตรศาสตร์
2. เพื่อสำรวจปัญหาในการอ่านเอกสารทางวิชาการภาษาอังกฤษของนิสิตปริญญาตรีคณะสัตวแพทย์ มหาวิทยาลัยเกษตรศาสตร์
3. เพื่อสำรวจกลวิธีที่นิสิตปริญญาตรีคณะสัตวแพทย์ มหาวิทยาลัยเกษตรศาสตร์ใช้ในการอ่านเอกสารทางวิชาการภาษาอังกฤษ

คำชี้แจง: แบบสอบถามแบ่งออกเป็น 4 ส่วน ดังนี้

- |           |   |
|-----------|---|
| ส่วนที่ 1 | ข้อมูลทั่วไปของนิสิต                                  |
| ส่วนที่ 2 | ความจำเป็นในการอ่านเอกสารทางวิชาการภาษาอังกฤษของนิสิต |
| ส่วนที่ 3 | ปัญหาในการอ่านเอกสารทางวิชาการภาษาอังกฤษของนิสิต      |
| ส่วนที่ 4 | กลวิธีที่นิสิตใช้ในการอ่านเอกสารทางวิชาการภาษาอังกฤษ  |

#### ส่วนที่ 1 ข้อมูลทั่วไปของนิสิต

โปรดกรอกข้อความ และทำเครื่องหมาย ✓ ในช่องที่ตรงกับความเป็นจริง

1. เพศ  ชาย  หญิง

2. อายุ \_\_\_\_\_
3. ท่านเรียนภาษาอังกฤษมาเป็นเวลาที่ปี \_\_\_\_\_
4. ท่านเคยเรียนวิชาการอ่านภาษาอังกฤษขณะศึกษาในระดับชั้นมัธยมศึกษา (ที่โรงเรียน) หรือไม่  
 เคย  ไม่เคย
5. ท่านเคยเรียนพิเศษวิชาการอ่านภาษาอังกฤษ (ที่สถาบันภาษาอื่นๆ) ขณะศึกษาในระดับชั้นมัธยมศึกษาหรือไม่  
 เคย  ไม่เคย
6. ท่านเริ่มเรียนภาษาอังกฤษที่มหาวิทยาลัยเกษตรศาสตร์ในระดับใด  
 Foundation English I  Foundation English II  
 Foundation English III  อื่นๆ โปรดระบุ \_\_\_\_\_
7. ท่านเคยลงทะเบียนเรียนวิชาการอ่านภาษาอังกฤษขณะศึกษาที่มหาวิทยาลัยเกษตรศาสตร์หรือไม่  
 เคย  ไม่เคย
- หากเคย วิชาใดที่ท่านเรียน  
 Fundamental English Reading  
 Reading for Mass Communications in English  
 Critical Reading and Writing in English  
 Others (please specify) \_\_\_\_\_
8. ท่านเคยเรียนพิเศษวิชาการอ่านภาษาอังกฤษ (ที่สถาบันอื่นๆ) ขณะศึกษาที่มหาวิทยาลัยเกษตรศาสตร์หรือไม่  
 เคย  ไม่เคย

**ส่วนที่ 2** ความจำเป็นในการอ่านเอกสารทางวิชาการภาษาอังกฤษของนิสิต

โปรดทำเครื่องหมาย ✓ ในช่องที่ตรงตามความเป็นจริง

- |   |         |            |
|---|---------|------------|
| 5 | หมายถึง | มากที่สุด  |
| 4 | หมายถึง | มาก        |
| 3 | หมายถึง | ปานกลาง    |
| 2 | หมายถึง | น้อย       |
| 1 | หมายถึง | น้อยที่สุด |

➤ ท่านจำเป็นต้องอ่านเอกสารทางวิชาการภาษาอังกฤษดังต่อไปนี้ในระดับใด

เอกสารวิชาการภาษาอังกฤษ	ระดับ				
	5	4	3	2	1
1. ตำราเรียนด้านสัตวแพทย์					
2. ตำราเรียนในสาขาวิชาอื่นๆ					
3. บทความวิจัยด้านสัตวแพทย์					
4. บทความวิจัยในสาขาวิชาอื่นๆ					
5. วารสารด้านสัตวแพทย์					
6. วารสารในสาขาวิชาอื่นๆ					
7. รายงานการวิจัยด้านสัตวแพทย์					
8. รายงานการวิจัยในสาขาวิชาอื่นๆ					
9. นิตยสาร					
10. หนังสือพิมพ์					

เอกสารวิชาการภาษาอังกฤษ	ระดับ				
	5	4	3	2	1
11. อื่นๆ (โปรดระบุ) _____					

➤ ทำนอ่านเอกสารทางวิชาการภาษาอังกฤษที่กล่าวมาข้างต้นเพื่อวัตถุประสงค์ใด

วัตถุประสงค์ในการอ่าน	ระดับ				
	5	4	3	2	1
1. เพื่อเตรียมสอบ					
2. เพื่อหาข้อมูลสำหรับการทำรายงาน (Report)					
3. เพื่อหาข้อมูลสำหรับนำไปใช้ในวิชา สัมมนา (Seminar Paper)					
4. เพื่อหาข้อมูลเกี่ยวกับประเด็นที่ยากแก่ การเข้าใจ					
5. เพื่อหาความรู้เพิ่มเติม					
6. อื่นๆ (โปรดระบุ) _____					

### ส่วนที่ 3 ปัญหาในการอ่านเอกสารทางวิชาการภาษาอังกฤษของนิสิต

โปรดทำเครื่องหมาย ✓ ในช่องที่ตรงตามความเป็นจริง

- |   |         |            |
|---|---------|------------|
| 5 | หมายถึง | มากที่สุด  |
| 4 | หมายถึง | มาก        |
| 3 | หมายถึง | ปานกลาง    |
| 2 | หมายถึง | น้อย       |
| 1 | หมายถึง | น้อยที่สุด |

➤ ท่านมีปัญหาในการอ่านเอกสารทางวิชาการภาษาอังกฤษในระดับใด

ปัญหาในการอ่าน	ระดับ				
	5	4	3	2	1
1. มีปัญหาในการอ่านจับใจความ เนื่องจากไม่รู้ความหมายของคำศัพท์ทั่วไป					
2. มีปัญหาในการอ่านเนื่องจากไม่เข้าใจคำศัพท์เฉพาะ					
3. มีปัญหาในการเลือกใช้ความหมายที่เหมาะสมจากพจนานุกรม เนื่องจากคำศัพท์นั้นมีหลายความหมาย					
4. มีปัญหาในการอ่านจับใจความ เนื่องจากความซับซ้อนของโครงสร้างประโยคภาษาอังกฤษ					
5. มีปัญหาในการอ่านเนื่องจากไม่มีความรู้ด้านไวยากรณ์ภาษาอังกฤษเพียงพอ					

ปัญหาในการอ่าน	ระดับ				
	5	4	3	2	1
6. มีปัญหาในการอ่านเนื่องจากขาดทักษะการอ่านเพื่อจับใจความสำคัญ					
7. มีปัญหาในการอ่านเนื่องจากขาดทักษะในการอ่านวิเคราะห์					
8. มีปัญหาในการแปลเนื้อเรื่อง					
10. มีปัญหาในการระบุใจความสำคัญจากเนื้อเรื่อง					
11. มีปัญหาในการสรุปเนื้อเรื่อง					
11. มีปัญหาในการลำดับข้อมูลที่ได้จากเนื้อเรื่อง					
12. มีปัญหาในการแยกข้อมูลระหว่างข้อมูลที่เป็นความจริงและความคิดเห็นของผู้เขียน					

ท่านมีปัญหาในการอ่านนอกเหนือจากที่กล่าวมาหรือไม่ หากมี โปรดระบุ

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#### ส่วนที่ 4 กลวิธีที่นิสิตใช้ในการอ่านเอกสารทางวิชาการภาษาอังกฤษ

โปรดทำเครื่องหมาย ✓ ในช่องที่ตรงตามความเป็นจริง

- |   |         |            |
|---|---------|------------|
| 5 | หมายถึง | มากที่สุด  |
| 4 | หมายถึง | มาก        |
| 3 | หมายถึง | ปานกลาง    |
| 2 | หมายถึง | น้อย       |
| 1 | หมายถึง | น้อยที่สุด |

➤ ท่านใช้กลวิธีในการอ่านเอกสารทางวิชาการภาษาอังกฤษในระดับใด

กลวิธีการอ่าน	ระดับ				
	5	4	3	2	1
1. กำหนดวัตถุประสงค์ในการอ่าน					
2. ใช้ความรู้เดิมที่มีอยู่ประกอบการอ่าน เพื่อช่วยให้เข้าใจเนื้อหาที่อ่านยิ่งขึ้น					
3. ตรวจสอบก่อนว่าเนื้อหาที่จะอ่านเกี่ยวกับอะไร					
4. พิจารณาว่าเนื้อหาที่อ่านตรงตามวัตถุประสงค์ที่กำหนดไว้หรือไม่					
5. ศึกษาองค์ประกอบของเนื้อหาที่จะอ่านอย่างคร่าวๆ					
6. ใช้ส่วนประกอบอื่นในเนื้อหา เช่น ตาราง กราฟ หรือแผนภาพ เพื่อช่วยเพิ่มความเข้าใจในการอ่าน					
7. ใช้ลักษณะของการพิมพ์ตัวอักษร เช่น ตัวหนา ตัวเอียง ช่วยในการหาข้อมูลที่สำคัญ					

กลวิธีการอ่าน	ระดับ				
	5	4	3	2	1
8. คาดการณ์ล่วงหน้าว่าเนื้อหาที่จะอ่านเกี่ยวกับอะไร					
9. ตรวจสอบว่าการคาดการณ์เกี่ยวกับเนื้อหานั้นถูกต้องหรือไม่					
10. ตรวจสอบความเข้าใจของตนเองเมื่อพบข้อมูลที่ขัดแย้ง					
11. อ่านอย่างช้าๆ และละเอียด					
12. พยายามมุ่งความสนใจไปที่การอ่านเพียงอย่างเดียว					
13. ปรับความเร็วในการอ่าน เช่น อ่านช้าเมื่อเนื้อหายาก และอ่านเร็วเมื่อเนื้อหาง่าย					
14. ขณะอ่าน หยุดและคิดเกี่ยวกับเนื้อหาที่อ่าน					
15. ประเมินข้อมูลในเนื้อหาที่อ่าน					
16. อ่านซ้ำอีกครั้งเพื่อให้เข้าใจยิ่งขึ้น					
17. เดาความหมายของคำศัพท์ที่ไม่รู้จากบริบทแวดล้อม					
18. อ่านเสียงดังขึ้นเมื่อเนื้อหานั้นยาก					
19. เปิดพจนานุกรมเมื่อพบคำศัพท์ที่ไม่ทราบความหมาย					
20. เขียนสรุปสั้นๆ ขณะอ่าน เพื่อช่วยให้เข้าใจเนื้อหาที่อ่านยิ่งขึ้น					

กลวิธีการอ่าน	ระดับ				
	5	4	3	2	1
21. เน้นข้อความที่สำคัญด้วยการขีดเส้นใต้ หรือ การใช้ปากกาสี (highlight) เพื่อช่วยในการจดจำ					
22. สรุปเนื้อหาหลังจากอ่านจบ เพื่อชี้ให้เห็นข้อมูลที่สำคัญ					
23. แลกเปลี่ยนความคิดเห็นเกี่ยวกับเนื้อหาที่อ่านกับคนอื่นๆ เช่น อาจารย์ หรือเพื่อนเพื่อตรวจสอบความเข้าใจของตนเอง					

ท่านมีกลวิธีการอ่านนอกเหนือจากที่กล่าวมาข้างต้นหรือไม่ หากมี โปรดระบุ

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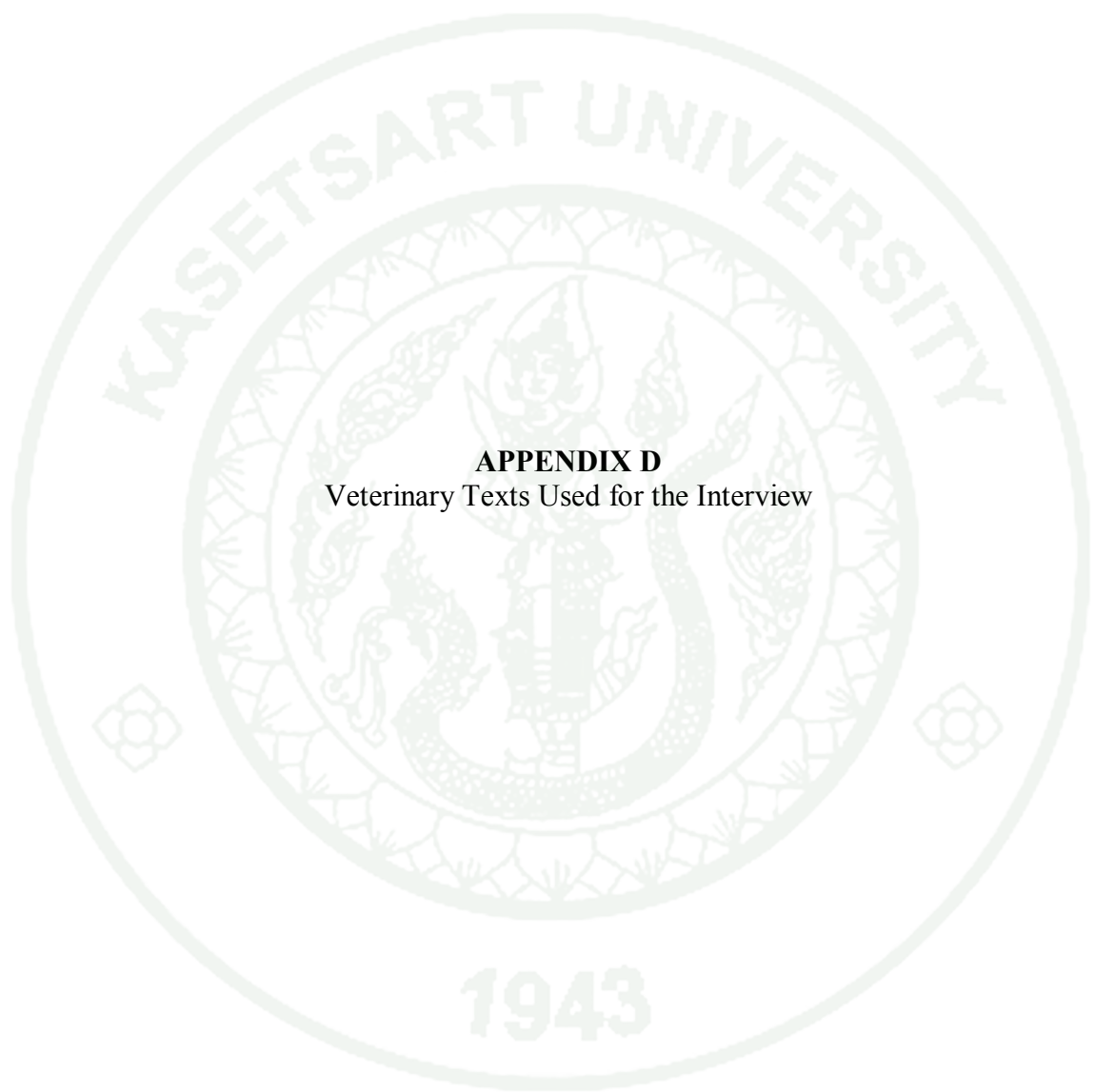


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**APPENDIX D**  
Veterinary Texts Used for the Interview

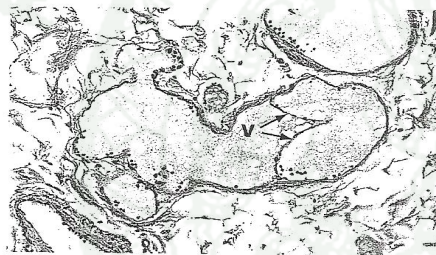
### The lymph vascular system

The lymph vascular system drains excess fluid, the *lymph*, from extracellular spaces and returns it to the blood vascular system. Lymph is formed in the following manner. At the arterial end of blood capillaries, the hydrostatic pressure of blood exceeds the colloidal osmotic pressure exerted by plasma proteins. Water and electrolytes therefore pass out of capillaries into the extracellular space; some plasma proteins also leak out through the endothelial wall. At the venous end of blood capillaries, the pressure relationships are reversed and fluid tends to be drawn back into the blood vascular system. In this way, about 2% of plasma passing through the capillary bed is exchanged with the extracellular tissue fluid. The rate of tissue fluid formation at the arterial end of capillaries generally exceeds the re-uptake of fluid at the venous end. The excess fluid, lymph, is drained by a system of lymph capillaries which converge to form progressively larger diameter lymphatic vessels.

As lymphatics get larger they acquire smooth muscle cells in their walls, and these contribute to the movement of lymph by pumping it onwards, the valves preventing back flow. Lymph eventually passes into much larger ducts (thoracic and right lymphatic ducts) which empty lymph into the blood circulation at the confluence of the internal jugular and subclavian veins of both sides. These large ducts have a substantial muscle layer with longitudinal and circular layers, but the layers are ill demarcated.

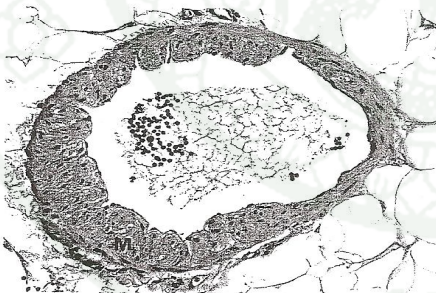
Along the course of the larger lymphatic vessels are aggregations of lymphoid tissues called *lymph nodes* where lymph is sampled for the presence of foreign material (antigen) and where activated cells of the immune system and antibodies join the general circulation (see Ch. 11). Lymphatic vessels are found in all tissues except the central nervous system, cartilage, bone, bone marrow, thymus, placenta, cornea and teeth.

Lymphatic capillaries differ from blood capillaries in several respects which reflect the greater permeability of lymphatic capillaries. In particular, the endothelial cell cytoplasm of lymphatics is extremely thin, the basement membrane is rudimentary or absent and there are no pericytes. Fine collagenous filaments known as *anchoring filaments* link the endothelium to the surrounding supporting tissue preventing collapse of the lymphatic lumen.



**Fig. 8.25** Valve of a lymphatic vessel  
H & E  $\times 40$

A characteristic feature of the lymphatic system is the numerous delicate valves in small and medium-sized vessels. The structure of these valves **V** is similar to that of valves in the venous system, but the supporting tissue core consists merely of reticulin fibres and a little ground substance. Note the presence of lymphocytes at the periphery of the lumina.



**Fig. 8.26** Medium-sized lymphatic vessel  
H & E  $\times 40$

Fig. 8.25 shows small lymphatic vessels containing a very small amount of smooth muscle in their walls. As lymphatics become larger, the muscle layer **M** becomes thicker and its contraction makes a greater contribution to the movement of lymph along the vessel, with backflow prevented by valves. The muscle layers are most prominent in the largest lymphatic vessels which empty into the venous system (the *thoracic duct* and *right lymphatic duct*).

**M** smooth muscle layer    **V** lymphatic valve

**BASIC ASPECTS OF CARDIAC FUNCTION.**

The heart, blood, lungs, and blood vessels compose an integrated physiologic system that supplies oxygen and other nutrients to tissues and removes carbon dioxide and other waste products. Efficiency of the heart muscle and of tissue functions throughout the body is critically dependent on adequate supplies of oxygenated blood. This necessitates a series of sensitive and dynamic control mechanisms to ensure that cardiac output is sufficient to supply cellular demands.

The three primary pathways by which the heart can increase its cardiac output in response to body needs for increased blood flow are: an intrinsic response of the muscle to changes in muscle length, changes in heart rate, and adjustments in contractility. These physiologic control systems are of considerable importance to pharmacology because the net response of the heart to drugs is controlled by these mechanisms.

**Intrinsic Regulation.** Contractile response of cardiac muscle to a change in its own length is the primary mechanism whereby the heart adjusts its pumping activity under normal physiologic conditions (Fozzard 1976). In the whole heart, the volume of blood returning to cardiac chambers from the veins controls resting muscle length. Individual myofibers are stretched as the intraventricular diastolic volume expands to accommodate increased venous return. The stretched muscle responds in turn with enhanced contractile strength, thereby pumping the increased volume of blood into the arterial circuits.

The fundamental capability of the heart to autoregulate its pumping capacity in response to end-diastolic filling, and thus muscle length, is referred to as the Frank-Starling law of the heart (Frank 1895; Starling 1918). This length-force relationship is the result of stretching the sarcomere to a more optimal interdigitating arrangement of the actin and myosin elements. The relationship between end-diastolic filling and cardiac output under basal conditions and under dominance by the sympathetic and parasympathetic nervous systems is shown in Fig. 23.1.

**Regulation by the Nervous System.** The autonomic nervous system regulates the heart mainly by adjusting cardiac rate and myocardial contractility. Details concerning cardiac effects and mechanisms of action of the sympathetic neurotransmitter norepinephrine and the parasympathetic neurotransmitter acetylcholine (ACh) are presented in Chaps. 5-7.

Sympathetic stimulation of cardiac muscle markedly increases the force of contraction irrespective of end-diastolic muscle length. A change in contractile strength that is independent of muscle length is referred to as a change in contractility (inotropy). In the presence of inotropic stimulation by the sympathetic system, cardiac output at each level of ventricular filling is enhanced considerably over the basal state (Fig. 23.1). Conversely, parasympathetic nerves exert their primary influences on cardiac output, not by changing the

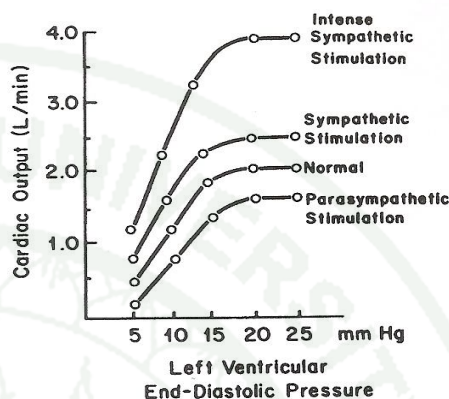


FIG. 23.1—Frank-Starling law of the heart. As end-diastolic ventricular volume increases, the myofiber is stretched, enhancing the contractile state of the muscle; cardiac output is thus increased. The cardiac output curve can be influenced by different degrees of sympathetic and parasympathetic stimulation.

inotropic state, but by adjusting heart rate. Vagal discharge produces bradycardia; with fewer heartbeats per unit of time, less blood can be pumped and cardiac output is decreased at all levels of venous return (Fig. 23.1). In contrast, sympathetic stimulation produces marked tachycardia and, within physiologic limits, cardiac output is increased proportionately. Coronary blood flow increases in response to sympathetic stimulation, but much of this change is secondary to increased metabolic-oxygen demands of the heart muscle.

Myocardial oxygen demand varies directly with three main factors: heart rate, myocardial wall tension, and inotropic state. Myocardial wall tension is directly proportional to ventricular radius (cardiac size) and intraventricular pressure, i.e., the law of Laplace. Primary determinants of ventricular wall tension are preload (i.e., end-diastolic volume and stretch) and afterload (aortic blood pressure). By reducing preload or afterload, certain drugs can elicit marked reduction in cardiac work without direct inotropic action on a heart muscle cell.

**Cellular Concepts.** The basic contractile unit of a heart muscle cell is the sarcomere, composed of the interdigitating protein filaments actin (thin filament) and myosin (thick filament). Activation of the filaments is regulated by a protein assembly unit composed of tropomyosin and troponin and associated with actin molecules. Availability of ionized calcium ( $\text{Ca}^{++}$ ) in the vicinity of troponin is the obligate modulator of the relaxation-contraction cycle.

## BIOGRAPHICAL DATA

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