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Senior College ESL Students' Reading Comprehension Level of a Technical Text

John Carlos S. Adversario

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SENIOR COLLEGE ESL STUDENTS' READING
COMPREHENSION LEVEL OF A TECHNICAL TEXT

A Seminar Paper

Presented to the
College of Graduate Studies
and Teacher Education Research
Philippine Normal University
Taft Avenue, Manila

In Partial Fulfillment of the Requirements
for the Degree Master of Arts in Teaching
with specialization in English Language Arts

John Carlos S. Adversario

March 2014

APPROVAL SHEET

This special project entitled **“SENIOR COLLEGE ESL STUDENTS’ READING COMPREHENSION LEVEL OF A TECHNICAL TEXT”** prepared and submitted by **JOHN CARLOS S. ADVERSARIO**, in partial fulfillment of the requirements for the degree of **Master of Arts in Teaching with specialization in English Language Arts**, is hereby recommended for approval and acceptance.

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ABSTRACT

Researcher : John Carlos S. Adversario

Title : Senior College ESL Students' Reading Comprehension Level of a
Technical Text

Key Concepts : Reading
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Prior Knowledge
Readability
Technical Text

Degree : Master of Arts in Teaching with specialization in English Language Arts

Adviser : Merry Ruth M. Gutierrez, Ph.D.

This study aimed to determine the senior college ESL students' reading comprehension level of a technical text, to identify the effect of prior knowledge on students' reading comprehension, and to find out if there is a significant difference in the students' prior knowledge before and after reading the technical text.

This study is a quantitative type of research that used the pre-experimental method using a technical text as a stimulus material. Forty (40) senior college Civil

Engineering students were given a pretest before they read the stimulus material, a technical text used in the discipline, and finally they had a posttest. The results were compared to determine difference in scores.

Major finding of this study showed that senior college ESL students still have difficulties in reading a technical text even though the topic presented in the material is related to their field of study. However, it is also noted that the students' prior knowledge increased as a result of their exposure to the text, which led to a significant difference between the test scores.

The study concluded that a technical text appears difficult even for students who are expected to have a good grasp about it. This could be due to the language used which is English, a second language for the student respondents, or it could be that they need more exposure to the text and more years to internalize the demands of their own discipline. Lastly, exposing students to technical texts improves their prior knowledge which consequently yield better comprehension score.

The study recommends further studies on other disciplines where technical texts serve as stimuli across year levels of different prior knowledge and different area of specialization to determine other factors that help comprehension, aside from prior knowledge brought to the reading task of highly technical material such as the one used in this study. Likewise, it is recommended to consider suitability of the texts to the discipline of the students, especially in test construction and text selection so that no single text and test are uniformly provided to students.

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CURRICULUM VITAE

Chapter I

THE PROBLEM AND ITS BACKGROUND

1.1 Introduction

Reading has always been a tedious task for a number of individuals especially for young learners who are exposed to different factors in their environment that may affect their attitude and their level of comprehension or understanding a reading text. Further, the complexity of the language especially when one has to use it for learning complex academic subjects has long been recognized. Researchers concerned with the educational process and with the reading process have investigated how these are influenced by educational, cognitive, psychological, and cultural factors (Cummins, 1981; Collier, 1995; Pajares, 2003).

Of particular interest has been the ability to use language in school subject matter learning termed as “Cognitive Academic Language Proficiency” (CALP), which is contrasted with what Cummins called “Basic Interpersonal Communicative Skills” (BICS), characterizing a more conversational language that is cognitively undemanding and embedded in context (Pajares, 2003). Cummins (1985) in Diaz – Rico & Weed (2002) mentions that in relation to BICS, CALP also represents a big importance in the student’s formal, academic learning process. CALP is said to represent the entire system of thought that is needed in comprehension and in learning. Both BICS and CALP play important roles in the recognition of the learners’ ability to learn in an English as a Second Language (ESL) classroom. To bridge the transition from the former to the latter, Common Underlying Proficiency (CUP) is of prime importance in facilitating understanding of content and discipline-specific language (Cummins, 1985).

Schema availability of the readers in relation to the text has long been claimed to have positive correlation with comprehension. Consequently, some learners tend to understand more and better than the others especially due to their familiarity with the language, content, and writing conventions of a reading material. However, when a given text is highly technical, then perhaps only those who are in the discipline would be able to grasp its intended meaning, since they are supposed to have a more direct and more schemata available with which to aid their comprehension. In an academic environment, this is normally measured through written exams.

Reading comprehension test has always been a part of any language examinations especially in the tertiary level. Most if not all of the time, teachers and/or test constructors choose any reading passages for testing with little or no considerations on the prior knowledge required from the test takers to be able to pass it. This practice is true across levels, but it is somehow more prevalent and more noticeably observed in so called “departmental examinations” taken by college students regardless of their disciplines and specific fields of specialization. Assumedly, if a text is familiar to a particular discipline, the test will automatically be biased for the students aligned to the discipline which will more likely help them answer the questions more easily than those whose specialization is not the topic of the text. As a consequence, they have the propensity to score higher and better.

Aside from this issue on generalizing a text no matter the fields of students’ specialization, there are still a lot of challenges that teachers and readers encounter. Reading comprehension in English, may it be literary or technical, has always been an educational problem, notwithstanding the fact that English and comprehension in this language are still the best way for students who will soon become future professionals can to get access to the world and gain the desired knowledge. Apparently, it is a must that students attain a certain level of

proficiency not only in their own field but also in the use of English and its comprehension as applied in a very technical situation. To have a good if not best comprehension of text written in English is perhaps a vital skill for these students to function as future professionals in their own fields. Unfortunately, reading comprehension has become a difficulty to many college students especially in dealing with technical texts.

Hence, this study is undertaken to determine the reading comprehension level of senior college ESL students of a technical text and identify the role of prior knowledge in facilitating learning, the results of which can influence the selection of texts for exams given to college students in various fields of specialization.

1.2 Theoretical Bases

Several theories could be listed as bases of the study, but the ones included are deemed to be more directly suited and more relevant to the research at hand. Theories on reading as an interactive process, the role of prior knowledge in facilitating textual understanding, demands of technical text for meaning construction, reading comprehension levels, and cognitive academic language proficiency (CALP) linked with English as a second language (ESL) integrated in the curriculum, are cited and explained.

Reading is a vital skill for learning, together with the language with which materials are written (Cummins, 1985). Educators have long believed that readers not exposed to the language patterns that a writer uses may encounter problems which affect comprehension (Barnitz, 1984 in Bernardino, 1998). Language patterns also serve as a source of knowledge which is the role of schema in the linguistic knowledge.

The schema theory poses that reading is a complex-interactive process as opposed to other theories stating that reading is a process that is more text focused than reader focused. The theory shows that readers' background knowledge helps in understanding that leads to comprehension. There are several studies that address the different types of schema. Goodman's (1982) classification gives four different types of schema- knowledge of the text, knowledge of the language or linguistic knowledge, knowledge on text structure, and knowledge of the world. Carrell (1987) classified schema into two types: content schema, which mainly focuses on the content or domain of the text; and formal schema, which refers to text structure, language component, and text type. Others separate the language schema from formal schema especially in relation to bilingual and multilingual learners.

The relations between prior knowledge and reading comprehension have been investigated under the schema theory. According to the theory, readers with more background knowledge are able to comprehend better than those with lesser background on the text (Johnston, 1984 in Bernardino, 1998), which is likewise espoused by interactive reading theory. Accordingly, said theory claims that an interactive process among the text, the world, and the learner happens when reading such that the reader's prior knowledge interplays with other factors just mentioned to construct textual meaning (Cook, 1986). Taken this into account, readers' prior knowledge affects the understanding of a text, like a demanding more discipline-specific technical text which uses specific content, discipline-based vocabulary, and particular language conventions.

The Department of Computer Science and Department of Mathematics in Canadian universities offer a definition of technical text by Copeck and Delannoy. They explain that a technical text highly deals with the complexity of the content rather than of the language. This

particular assumption frees a technical text from figurative language that sometimes affects the comprehension of the learners especially if the non – technical text is written by a native speaker. Technical texts are also more direct and active in tone that enable the learners to interact more with this background and with what they still want to know in connection with a specific field of inquiry or knowledge.

Likewise, the vocabulary load of a technical text is directly in congruence with the discipline such that idiomatic expressions, figurative language, and those that are geared toward imagination are less likely to be a part of a technical text. In short, it is different than what is normally required for general reading of ESL learners which is basically in narrative form, or literary in nature. With literary texts, cultural knowledge affects reading comprehension, as in the case when most literary texts used in standardized tests are lifted from the cannon of literatures of the world. The investigation of Mokhtari and Reichard (2003) has found out that the cultural load of a text affects not only the comprehension but also the strategies employed by bilingual learners.

Cultural knowledge may not be as conspicuously present in technical texts as in literary ones since most disciplines around the world speak of the same language. It is in this light that could explain why more students tend to understand a text related to their field than a novel or a literature book that has a great load of culture from where it originated or from the background of the native writer. Despite the less cultural knowledge demand of a technical text, a different case could be said when it is written in a language which is not the readers' own, like the case of English in the Philippines, which is considered a second language next only to Filipino and more than a hundred first languages of the Philippine archipelago. Consequently, a text may appear difficult not because of its content but because of the language with which content is expressed.

For instance, a text for civil engineers may be understood by all who are in the same field of discipline, yet the language could be a barrier when it is not the readers' first language. As a result, readers could have different reading comprehension levels in processing a technical text.

McKeena and Stahl (2009) describe these reading comprehension levels as independent, instruction, and frustration. For a given test, a score between 90% and 100% is said to be an independent level, defined as the supplementary and autonomous reading where students read at home or in school without aid because the material cause no difficulty at all. However, a score between 75% and 89% is an instructional, or the teaching level in which the text is challenging yet not too difficult that the teacher's scaffold will help in comprehending a text. Finally, the frustration level is when the score falls to 50% and below, the lowest level of reading that even with teacher assistance, the text is still too difficult and frustrating on the part of the reader.

From all these levels could be added a borderline level, a case when the scores are at the extreme ranges of the cut-off scores for each. For instance, a score of 89% is a borderline of instruction toward the independent level, or a score of 50% is a borderline for frustration toward the instruction level. Nevertheless, several sources of information could be used by bilingual readers to achieve good comprehension of a technical text.

The readers' content schema helps in the processing of a specific topic or text, and their curriculum prepares them for the demand of such text. The curricular inclusion of a course on English for Specific Purposes (ESP) helps address the teaching of the language or the second language based on the content foundation of the learners. This has also been taken into account in Cognitive Academic Language Proficiency (CALP) to promote the learning of the language in an academic setting. Learning English as a Second Language (ESL) normally occurs in the

academic context which is considered important in pursuing a long term success in school (Buttler, Hakuta, & Witt, 2000). As also pointed out earlier, academic English proficiency including reading comprehension takes longer to develop than oral English proficiency. In a normal school setting, a student may be able to interactively and productively communicate in the target language but comprehension of reading materials may not be as high as the oral communicative level.

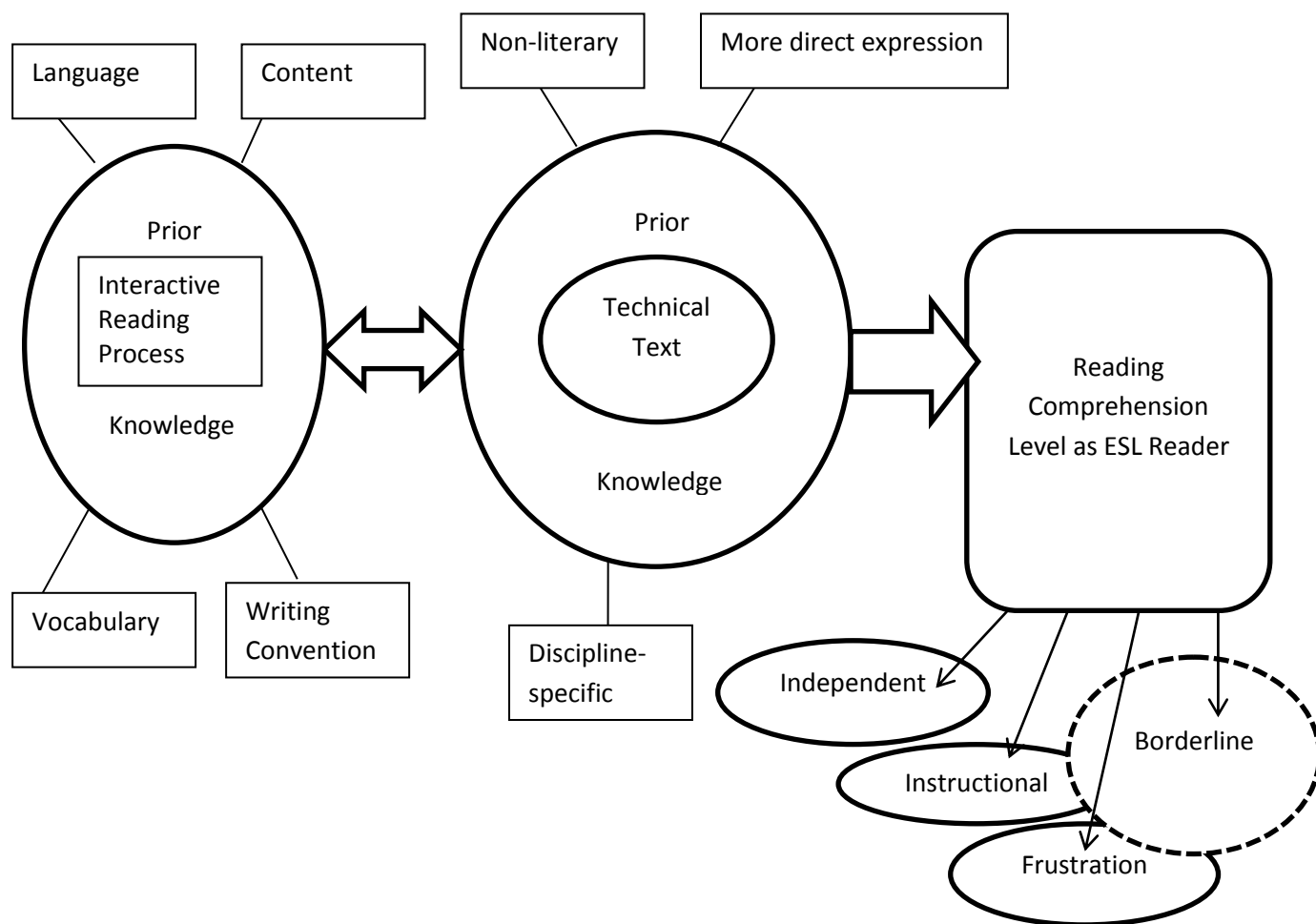


Figure 1. Conceptual Framework of the Study

Reading viewed from an interactive perspective highlights the role of prior knowledge or schemata, the knowledge structure of a person, which according to cognitivism, is a natural propensity of the mind to organize and find logical structure of the various sensory stimuli perceived by the brain. Accordingly, prior knowledge influences reading comprehension at all levels which explains the strong relationship between prior knowledge and comprehension. A good account of prior knowledge constitutes into a good comprehension or comprehension ability (Pearson, 1982).

The readers' background knowledge or schema on language, content, and writing convention greatly affect their understanding of written texts. Readers who have established better prior knowledge or schema on their readings can comprehend better than those who have limited knowledge. Wide readers or those who are exposed to various types of texts are said to have the edge over those who are not.

Processing a text appears more complex when the language used in a written material is not the readers' first language, as in the case of English which acts as a second language among Filipino learners. Although they seem to have more cognitive resources to process a text because of their bilingual backgrounds, they seem to lack direct first hand experiences which consequently force them to rely on linguistic cues to make sense of the text written in their second language.

The reading material and the reader's prior knowledge pose an importance in determining the reader's level of comprehension. As regards the texts, the readers process them based on the demands required, which could be different especially when a material is a technical text

characterized as non-literary, content specific, and more direct expression devoid of figurative language and idiomatic expression.

Considering the factors already mentioned in relation to reader and text coupled with the significant role of prior knowledge in the reading process, the levels of comprehension can then be described, whether independent, instructional, frustration, and borderline. These help in planning instruction particularly in the choice of material for instruction and for examination.

1.3. Statement of the Problem

This study aimed to determine the role of prior knowledge in reading a technical text written in English as a second language among college students.

Specifically, it aimed to:

- a. assess the reading comprehension level of college students prior to reading a technical text;
- b. determine their reading comprehension level after reading a technical text; and
- c. find out the difference between the pre and post test scores.

1.4 Significance of the Study

The following may find the study beneficial:

English Language Teachers may see this as a way to improve their assessment of learners' reading level as they consider discipline-specific demands in teaching and testing appropriate for the learners' field of specialization.

Technical Teachers in the specific domain may find this as a way on how they can address the needs of their students in their respective subject areas. This can also be viewed as they choose the type of material they present in their classes and tests.

Curriculum Planners may look into this research as a way on how they can develop the existing curriculum in their institutions aligned with the use of technical texts in each domain catered by their department or institution.

Test Developers especially those who work on standardized tests may find this valuable in their construction of tests mainly on the reading comprehension part. The findings on the readability and schema availability may be used as guidelines on the construction of tests.

Instructional Materials Developers mainly those engaging in the tertiary level may incorporate the use of technical texts that are domain specific in the preparation of the instructional materials. On the other hand, the elementary or high school level materials developers may look into using texts that are content-based.

Future Researchers may see this as a basis for further studies related to reading comprehension, readability, and text technicality for ESL learners.

1.5 Scope and Delimitation

This study mainly focused on the effect of prior knowledge on the reading comprehension of a technical text used in the tertiary level.

The study used a case study reading text as the stimulus material read by forty senior college students under the civil engineering program of a private university in Manila. The samples were purposively selected based on the following criteria: 1) should be a senior civil engineering student; 2) should have taken most of the major subjects; and 3) should have finished the course *Strength of Materials and Building Construction*.

1.6 Definition of Terms

The following terms are presented based on their conceptual and operational definition.

Borderline Reading Level. It refers to the extreme score in the range of cut-off scores for a given reading level.

Frustration Reading Level. It is the level which is too difficult to a reader even with teacher assistance and scaffolding, resulting to a score between 50% and below.

Independent Reading Level. It refers to a level in which the reader finds the material easy that it can be understood without teacher assistance and can be read at home alone. It is determined by a score between 90% and 100% in a comprehension test.

Instruction Reading Level. It is also called the teaching level in which a reader gets a score between 75% and 89%, good enough for a text to be understood with teacher assistance.

Prior Knowledge. It is the large body of information that is learned throughout a lifetime of experience (Henry, 2004). In this study, it is used as the body of knowledge that affects the comprehension level of the students.

Reading Comprehension. It is the reconstruction of the stated and implied meaning in a text (Albee, Manson & Manson, 2004). In this study, it is viewed as the variable being affected by the reader's background knowledge. This is the one being primarily tested in this study.

Technical Text. It refers to a kind of text that is highly discipline-based, non-literary, and more direct expression of content learning shared by those who are in the same field of study.

Chapter II

REVIEW OF RELATED LITERATURE

This chapter presents a survey of literature on reading, prior knowledge, reading levels, ESL learners, and technical text. The readings presented here widened the perspective on the topics relevant to the study.

Reading View

Reading is a cyclical process by which a reader reconstructs a material through the use of sampling, predicting, testing, and confirming, embodying what Kenneth Goodman calls the psycholinguistic guessing game. After the confirmation that the reading text is in congruence with the reader's prior or background knowledge, the process begins again (Goodman, 1971). However, Goodman's view contrasts Silverstein's (1987) saying that "reading is essentially a mechanical decoding of speech written down". The two extreme views of reading make it hard to clearly establish how the reading process goes, yet the focus of the former is on the reader, while the latter is perhaps a guide for reading instruction, which according to Lundberg (1999) is an unnatural act. Consequently, learners have a great difficulty in the process of acquiring this skill in much the same way that teachers find it difficult to teach and hone. According to him, reading is something not acquired through experiences alone, but is explicitly taught to learners.

In relation to Goodman's psycholinguistic guessing game is Rumelhart's (1977) idea that reading is an interaction between the text and the reader. He emphasizes that meaning does not only come from the text itself but it is also from the reader's knowledge, and that the language of reading and its understanding conform with one's knowledge on the topic or on the material.

Devine (1986) points out that comprehension is greatly influenced by the acquired knowledge a reader brings into the material. A reader's prior knowledge shapes his or her interpretation and understanding of the text. Schema's ability to account or affect a lot of mental activities has a profound effect in reading comprehension. Relating this to English as a second language, Lee (2012) claims that English reading is a fundamental form of language inputs, and is a psycholinguistic process for active reconstruction of a message from a written language. Reading is not only essential to in – school academic learning but also to lifelong learning (Dole, Duffy, Roehler& Pearson, 1991; Durkin, 1993; Lee, 2012).

Lee (2012) posited that reading comprehension is the construction of the reading process between the text and that what a writer creates. He elaborated that it is a meaningful interpretation of the selected passages in reading texts. The reading comprehension process is the interaction between what the author has written and the reader's background and experience, a cognitive process of uncertainties about meanings. In all these, the success of reading comprehension depends on the factors such as text, the genre of the text, reader's language proficiency, text difficulty, and the task demands (Alderson, 2000). Each reader's prior knowledge whether of a specific item of information, a specific skill or concept must have some influence on how he or she approaches the printed text (Devine, 1986). Prior knowledge influences reading comprehension at all levels. There is a strong relationship between prior knowledge and comprehension. A good account of prior knowledge constitutes into a good

comprehension or comprehension ability (Pearson, 1982). Devine (1986) mentions that schema theorists believe that all knowledge is packaged in units, called schemata and that the knowledge stored is activated upon the reader's exposure.

A reader's schema is very vital in the reading process because it helps in the easy and better understanding of the material being read. A reader who has better prior knowledge tends to understand more and easily compared to one who has not. This particular paradigm brings the light that as language teachers in the tertiary level one must be able to activate and consider the students prior knowledge. This could also be applied in the lower levels or grades wherein schemata most of the time are not being taken into consideration by language teachers in the choice of materials being presented to students.

Reading comprehension has something to do with the thinking, learning, and expanding a reader's knowledge and horizon of the world other than just by retelling what happened or answer questions posted by the teacher (Hutchins & Zimmerman, 2003). In her study Yang (2002) said that reading is a complete grasp of meaning in a written text in which dynamic interrelationships in the text is required. Bates, Barr, Blachowicz, Katz & Kaufman (2007) stress out that it is not only one's knowledge on a topic that matters but also one's prior knowledge on the vocabulary used in a particular text. Therefore, it is not only one's content knowledge that affects comprehension but also one's prior knowledge on vocabulary.

However, Croninger and Valli (2009) defined reading is a skill that can be taught apart from any connection, genre, and cultural conventions believed to be implicated in efforts to read in a particular setting. Furthermore, they assumed that reading involves a single set of transferrable skills or abilities that can be taught in isolation. Yet Smagorinsky (2009) argued

that “texts’ used in reading do not share the same properties and need not be taught in general. On the basis of Smagorinski and Smith’s (1992) definition that reading does not only involve a general set of skills but is composed of differentiated skills according to tasks and readers.

Prior Knowledge and ESL Reading

The term schema refers to the mental organization of an individual's past experience (Bartlett, 1932). Schema theory, based on the psycholinguistic model of reading (Coady, 1979), views reading as an interaction between the readers' background knowledge and the reading text. Pearson-Casanave (1984) points out that the text alone does not carry meaning; instead, it provides clues that enable readers to construct meaning from existing knowledge. The text activates and builds on existing schemata. In other words, as people read, they make assumptions about the information not only based on what the text says, but more importantly based on the readers’ knowledge structure existing in their schemata.

Henry (2004) defines prior knowledge as the large body of information that is learned throughout a lifetime of experience. He also emphasizes that knowledge is gained from experience and stored in memory. The more prior knowledge a person has on a topic, the more likely one can understand the topic.

Prior knowledge has also affected comprehension in most readers in the second language. This has also been used in some strategies in teaching reading particularly in the K-W-L method. Activation of the prior knowledge entails more understanding on the part of the reader (Manzo, Manzo& Albee, 2004).

The information that a learner acquires on a topic is in a distinct pattern that is organized properly in the brain. Prior knowledge is also said to be arranged in hierarchy, meaning – the larger information on a topic is stored in the brain – the better understanding one could have in his or her brain. This particular structure helps in building and achieving comprehension (Fleener, Morgan & Richardson, 2006).

Schema theory and research (Aron, 1986; Carrell, 1984, 1987; Carrell & Eisterhold, 1983; Johnson, 1981, 1982; Nelson, 1987; Obah, 1983) demonstrate that students' reading comprehension is higher when reading about something familiar to them. Hauptmann (2009) observed that readers with abundant background knowledge and low language ability could still extract information from the text. Authentic texts that are of content in nature are better used than those of linguistically simplified texts.

Reading is not a top – down process as what was claimed by Goodman & Smith (1982), they mentioned that reading is a process wherein a the schemata plays an important factor in the reading process. They even categorized the four kinds of knowledge that affect reading comprehension; knowledge of the text which deals on the content domain of the reading material, the knowledge of language which is focused on the language component and structure of the text, knowledge of the text structure which anchors on the way the text was written, its structure and even on how sentences were constructed to form a one whole discourse and finally, knowledge of the world that a reader brings into the text which accounts for the simple prior knowledge that one gets in his experiences.

A number of studies present that other students learn more than the others because they are able to come up with a mental or visual representation of an image presented to them. These

images are said to have been formed and stored long before they get acquainted to it in their memory. Psychologists claim that learning new information depends on relating to what has already been known. Learning is said to be more in context and organized if learners have a clear pattern of ideas present in their minds (Nutall, 1999 in Fleener, Morgan & Richardson, 2006). This pattern may be limited for second language learners because they may have little or no direct experience at all with the context of the native speakers.

L1 and L2 readers differ on how they manage their mental resource and how they utilize learning strategies. Amato (1996) identifies several characteristics which are unique and distinct among second language learners. One, L2 learners process language input internally until they feel ready to use it productively. Second, their cognitive resource is more highly developed since they need to accommodate and understand not only one but several language inputs which may not necessarily be related or similar. In most cases they can learn and apply rules more readily because the transference of their L1 knowledge to L2 rules provides them a basis for understanding another language. They usually have more control over the input so much so that they can deliberately decide on what to have and how to avoid certain situations based on their assessment of own capability.

Reading Instruction

How to teach reading seems to pose a great challenge among teachers. To help them clarify what reading instruction should have, Albee, Manzo and Manzo (2004) formulate the key concepts that teachers and readers must know in the reading process. In their book *Reading*

Assessment for Diagnostic – Prescriptive Teaching, they discuss eleven terms which can serve as guide in planning for instruction in reading.

The first term is fluency which involves oral reading where there is the natural flow of language through reading that represents the meaning of the text. Next is word recognition or as others claim as “sight words”, shown through an instant connection made between the words in print and their spoken equivalent. Third key concept refers to strategies, or the deliberate use of skills to reconstruct meaning from the text. It is followed by schema activation, or the intentional calling to mind the ideas and knowledge presented in the text that are already present in the reader’s mind. Next concept refers to metacognition which entails the awareness of readers’ understanding on their readings, their own regulatory measures to monitor their thinking processes to attain goals set. After this is the fix – up or fix-it strategy in which readers attempt several solutions to solve problems encountered while reading. Another key concept is word identification, or the process of decoding the written text through phonics, context, and structure. Still, key concept in reading instruction is reconstruction of stated and implied meanings to present the accurate understanding of what is really meant by the author may it be explicitly stated or not. Constructing relevant evaluations, interpretations, and applications is to be considered a key concept as well as it involves how one draws conclusions out of the text, tantamount to what Miranda - Plata, et. al. (2006) refers as critical reading in their table of reading skills and purposes. Additionally, internal and external suggestion is also a key concept which refers to how a reader moves into the constructive level of thinking. Finally, phonetic decoding, or the use of symbol – sound associations to determine the spoken value on the text, is deemed important to reading instruction.

Clearly, the list of key concepts just presented proves that reading is not just regarded as a skill to be acquired but it is a sum of a number of processes that are involved in reconstructing the meaning of a written form. It also shows how reading is regarded not just a skill but a process in an individual's learning. Reading is indeed an important factor in learning; writing and speaking depend on reading because how can one react on something if he or she does not have the necessary knowledge which can be acquired through reading. In the same light that one cannot write as much if he or she has a weak theoretical background or knowledge on something.

Dowhower (1999) presents a Comprehension Strategy Framework that would help in facilitating the development in areas where strategic and ineffective readers differ. The framework includes: 1) Prereading for schema activation; 2) Metacognitive mentoring; and 3) Reflection and schema – building after reading.

This particular framework explicitly shows how prior knowledge plays an important role in the comprehension process. This is also presented through the different phases in the presentation of a lesson in the classroom. The framework also guides the teachers on how they could adapt to the needs of the less effective readers.

In the Prereading stage, also coined as the enabling stage, the teachers determine the background knowledge of the students on the topic. Then, they relate the topic to the background information. In relating the text to the background information the students then know how to understand the text in conjunction with the background knowledge activated earlier. The teachers then set the focus on the text.

This particular stage shows the vital role that prior knowledge has in the understanding of the text. It is not only through activation that a student would get acquainted to the text but also on how the text is to be related with their schema.

The active reading stage is the interaction among the teacher, student, and the text. In cycle 1, the purpose for reading must be established by giving the reasons why there is a need to read the material. Cycle 2 focuses on the discussion as well as on the repeat cycle if the need arises. The final discussion now leads to the questioning of the theme and comprehensibility of the text. The effectiveness of the active reading stage delves on how effective the prior knowledge was activated.

The students then engage on their independent activities as to where they would try to recall the content of the text through the help of the comprehension questions. The student response follows this sub stage opens for the free thinking of the students on how they regard the text. Retelling is one of the ways on how we could measure the comprehension of the reader on the text.

As for the teachers, they must be able to assess the effectiveness of the strategies employed through the manner of questioning and scaffolding of the textual matters.

Readers engage in learning when they recognize a connection between what they know and the learning experience. Teachers provide new experiences that arouse interest and attention on the topic. The teachers should be able to guide the students in the reading or learning process to deepen the understanding of the text. If there is little prior knowledge or it is not activated prior the reading of a text, the students would have to be given more attention on the instructional support or guidance in their reading (Diaz – Rico & Weed, 2002).

Reading Assessment

In the Basic Model of Reading Diagnosis presented below Barr et.al. (2007) show that comprehension is the central and most important process in reading, defined as the ability to reconstruct meaning from the printed text. This also says that the main goal of reading is comprehension that is why it is very important for the learner to be able to understand the material or else reading would defeat its purpose.

As further explained in their book, Bates et.al posit that comprehension is both a strategic and constructive process as guided by Huey's (1968) claim that comprehension is "thought – getting and manipulating"; and Thorndike's (1917) statement of comprehension as "reasoning" for it is in comprehension that one refines, interprets, and evaluates the information contained in a text read.

Comprehension is also based on the development of the conceptual knowledge one has. This conceptual knowledge helps in the awareness of a reader on the transactional nature of reading and writing to give one the motivation to become independent readers and capable users of the language in which are among the facets of comprehension.

Embarking on the said conclusions, Blachowicz and Ogle (2007) write that comprehension is a process of making meaning that makes the idea a constructive one. According to them a reader connects what he or she already knows to information and ideas given by the author in a text.

Reading in the content areas has typically meant “reading to learn,” as differentiated from beginning reading instruction (McKenna & Robinson, 1990). This stage is more complicated and requires a more difficult textual content and linguistic expression for learning various disciplines and fields of study. This stage promotes independent, autonomous reading for critical thinking and appreciation of pluralistic views on contexts and content.

With this reading stage, assessment of reading comprehension has a two - fold purpose. The first purpose of this assessment is to enable the teacher to make sound decision on the type and level of materials that are to be used appropriate for the demands of the curriculum. The second purpose is to let the teachers assess the needs of the learners in order for them to address the latter’s weaknesses (Blachowicz and Ogle, 2007) so as to promote engagement in various text content and disciplines.

Technical Reading Text

Johnson (1982) discussed that the characteristics of a text have a large impact on the reader’s ability to comprehend it. The cultural load and level of vocabulary also influence the reading comprehension of learners. What makes a technical text different from the content text is the former’s nature of word use, language structure, written convention, and discipline-based textual processing. It can be compared to English for specific purposes (ESP) in which the language behaves based on the context it is used.

A technical text is described by Canada-based professors as discipline-specific, non-literary expressions with own vocabulary load and register. It is supposed to be devoid of use of figurative language and idiomatic expressions which are commonly culture-based. For example,

the medical world contains technical texts using the vocabulary understandable among those who are of the same discipline. Samples of technical texts are abstract, and case study, among others.

Chapter III

METHODOLOGY

This chapter discusses the research design, instruments used and procedures in identifying the effect of prior knowledge on the reading comprehension level of college students as ESL readers.

3.1 Research design

This study is a quantitative type of research that used the pre-experimental method. Travers (1978) claims that the best possible way to answer the problems posted in a research is through scientific reckoning. Furthermore, it is elaborated that experimental design in research substantiates advancement in scientific knowledge. From its barest definition, experimental approach is manipulating one variable while leaving one on its natural state. The treatment then is employed on the manipulated variable and thus, the difference becomes evident.

3.2 Instruments

3.2.1 Stimulus Material

The researcher used a case study as a stimulus material whose readability was checked using Fry's Readability Formula (McKenna, 2010) to assess the level of difficulty and to find out whether the material is suited to the level of the readers. It was taken from an internet source focused on civil engineering issues and challenges. The text's readability falls on the 17th level

which is equivalent to fourth and fifth year college level in the Philippines, appropriate for the level of the respondents. The text was then validated by content experts who are civil engineers by profession and language experts who are English language collegiate instructors. The topic of the reading text is on building construction titled “*Structural Assessment of an Existing Precast Concrete Superstructure for Change of Use*”.

3.2.2 Anticipation Guide to Assess Prior Knowledge

An anticipation guide by Herber (Buehl, 2000) was used in determining the prior knowledge of learners before and after reading a technical text. This instrument forecasts the major ideas of a text to find out agreement of knowledge between the text and the reader. The anticipation guide was based on the stimulus material in which ten (10) statements were lifted and paraphrased to present the text’s major concepts. These were arranged sequentially according to the order of their appearance in the stimulus text (McKenna & Stahl, 2009). Respondents were told to read each statement and to answer whether they agree or disagree with it. This way, the statements correctly answered based on the stimulus were reflective of adequate prior knowledge, whereas those incorrectly answered would reveal inadequacy or absence of appropriate prior knowledge. Hence, the higher the score in the anticipation guide, the closer is the matching with the technical text content, and therefore the more relevant is the prior knowledge, and vice versa. (Please see Appendix A for the Stimulus Material).

The anticipation guide was used twice in the study. The first was for the pre-test (Please see Appendix B) to measure how much the students knew about the technical text, and the second was for post-test (Please see Appendix C) after the stimulus text was read by the

respondents. The difference between the two was the rearrangement of the statements in which the sequence of sentence appearance was already jumbled in the post-test, unlike in the pre-test when these statements were chronologically presented based on their sequential order in the stimulus material.

3.2 Respondents

The study was conducted in a private higher education institution in Manila. The subjects purposively selected were forty (40) collegiate students enrolled in the Civil Engineering program. The class was chosen based on their specialized field of study in relation to the stimulus text, and on the premise that they have already taken most of the major subjects, which explains why seniors were the selected participants, including particularly the topic *Strength of Materials and Building Construction*. This was due to the fact that the technical text presented to the students contained topics and technical terms that are used in the subject just mentioned.

3.3 Data Gathering Procedure

There were six phases followed for the data gathering of the study starting from the identification of a stimulus material to its administration and interpretation to answer the questions raised in the study.

Phase 1: Looking for the appropriate stimulus material

Since the researcher handles English for Specific Purposes (ESP) which uses highly technical texts for learning discipline-based content, a stimulus material connected to civil engineering was selected for a class of senior college civil engineering students currently taught by the researcher. Once the discipline and the year level of the target respondents have been decided on, the following were undertaken:

- a. A search for the appropriate type or form of the technical text was made to serve as the stimulus material of the study. This led to the choice of a case study sample of technical text because this text type was common in the discipline.
- b. Several case studies were identified from available textbooks, references, and internet sources. To ensure that the stimulus material was not required for classroom reading, textbooks and traditional reference sources were excluded from the search. The internet source then became the choice for the technical text to use as stimulus material, which consequently pointed to a topic on building construction and strength of materials, a text which had direct bearing to the specialization of the respondents.

Phase 2: Preparing and validating the stimulus material and the comprehension check

- a. The Fry Readability Formula was run to establish the difficulty level of the material and to determine the appropriate level for which it should be given. The results showed that the text was appropriate for grade 17 readers, equivalent to senior college in the Philippine educational system.

- b. The text was expert validated by a civil engineering faculty first and then by the English faculty who determined whether the technical vocabulary, the content, the language used, and the topic specific to the respondents' discipline were appropriate, clear, and grammatical. When the expert judgment was in favor of the text, it was encoded as a stimulus material of the study.
- c. When the stimulus text was already finalized, the anticipation guide for pre-reading to check prior knowledge was prepared. For post-reading comprehension check, the same statements from the anticipation guide were used, but this time these were rearranged to avoid the memorization of ideas based on presentation familiarization, and thus lessened the possibility of getting the right answers by rote memory. Also, the mixed-up sentences by themselves were already a good measure of comprehension rather than of memorization to get a high score.
- d. The expert validators, civil engineering and English faculty members, checked the statements of the anticipation guide for technicality by the former and for language aspects by the latter so that the validity could be had prior to the pilot run.

Phase 3: Pilot Testing

- a. A pilot testing was done among twenty (20) Nursing students to check how well they could comprehend a technical text which was not part of their specialization. Assumedly, they would not get a high score since they had little or no exposure at all to the civil engineering discipline and its technical

texts. Also, the pilot testing was done to approximate the time for completing the task, to practice on the instructions to the students, and to identify possible changes before the actual use of the text to the target respondents.

- b. As a result of the pilot test, the stimulus text was modified on areas of increase of font size, clarity of instructions, and overall layout and format of the stimulus text.

Phase 4: Arranging the schedule of data gathering with the respondents

- a. The civil engineering professor of the intended class was asked whether the class had already taken a course in which the topic *Strength of Materials and Building Construction* was tackled in the previous discussions.
- b. With permission of the professor, the researcher requested to arrange with the civil engineering class the time and day of the actual data gathering.
- c. When the date had been set, the stimulus material was reproduced to provide each respondent a copy.

Phase 4: Administering the Anticipation Guide

- a. On the scheduled date, the students were oriented on the purpose of the study and on the process of the data gathering. It was emphasized that there was no time limit set to finish answering the statements.
- b. The students were then asked to read the ten statements and check the statements they agreed with and leave blank those that they disagreed with.

When they finished doing the anticipation guide, they were told to submit their paper and to start reading the stimulus material.

Phase 5: Reading the stimulus material

- a. The students were asked to read and comprehend the stimulus text. They were reminded not to hurry in reading the material and to fully comprehend what it was talking about.
- b. Approximately, the students were given twenty (20) to thirty (30) minutes to read the stimulus material as recommended by their professor in the major subject, which was also almost the same time as that spent by the students in the pilot testing.
- c. The students were asked to return the stimulus material to the professor when they felt that they had already read and fully understood the case study they read.

Phase 6: Administering the comprehension check

- a. The comprehension check was distributed to the students for post-testing.
- b. As in the pre-test, the students were asked to put a check mark on the statements they agreed with and leave those which they disagreed with based on the text they read.
- c. The respondents were not allowed to go back to the stimulus text since they did not have the copy anymore. Instead, they were encouraged to think about

the text, visualize content, and to choose only the relevant knowledge in connection to their course of specialization.

- d. There was no time limit given to answer the comprehension check questions, although this was already approximated to last between 15-20 minutes as observed in the pilot test.
- e. The answer sheets were collected and checked for comparing the pre and post test results.

3.4. Statistical Treatment of the Data Gathered

This section discusses how the data gathered were analyzed using statistical treatments.

3.4.1 On Reading Comprehension Level before Reading

- a. The anticipation guide was checked and recorded individually.
- b. The scores were then transmuted to percentages for the assessment of the comprehension levels.
- c. the transmuted scores to percentages were evaluated based on the level of reading comprehension.

3.4.2 On Reading Comprehension Level in the Post-test

- a. The post-test scores were tabulated to identify the reading level after reading.

- b. These scores were grouped based on the cut-off range assigned for the level. These were presented by reading level categories to find out which level has the most number of students.
- c. The pre-test and post-test score comparison was also done to determine the effect of exposure to text and experience with a technical material on the respondents' improvement in prior knowledge translated into higher comprehension scores and better understanding.

3.4.3 On the Significant Difference between Pre- and Post-test Scores

- a. The scores in the pre reading and post reading were encoded in the SPSS, a statistical package used to compute data in behavior sciences studies.
- b. The data were then analyzed using T – test for independent samples and were run using SPSS.
- c. The results were used to find out whether there was a difference between the two scores and whether the difference was significant.

Chapter IV

PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This chapter discusses how the data gathered were studied, analyzed, and interpreted to answer the questions raised in the study.

Objective 1: Assess prior knowledge before reading a technical text

The 10- item anticipation guide was administered to the respondents. The papers were checked and the results became the basis for determining the comprehension level based on Informal Reading Inventory (IRIs) criteria by McKenna and Stahl (2009) as shown below.

Table 1. Reading Comprehension Level

Level	Score	Description
INDEPENDENT	90 – 100 % comprehension	This is the level of supplementary and independent reading. A learner should be able to read the book at home or school without aid. The material causes no difficulty.
INSTRUCTIONAL	75 – 89 % comprehension	This is the teaching level. The reading material must have been challenging and not too difficult.
FRUSTRATION	Less than 50% comprehension	This is the lowest level of readability even with a teacher support. The material must have been too difficult and frustrates the reader.

Table 1 shows the three levels of reading comprehension by McKenna and Stahl (2009). The independent reading level is the highest level at which students can read fluently with good comprehension without instructional assistance. The independent reading level is also known as “free-reading level”. In the independent level, the students are expected to comprehend within ninety percent to one hundred percent (90 – 100%) on his own, meaning that a reader must be able to understand what he or she is reading even without the supervision of the teacher. If the student or reader enjoys what he or she is reading it may be said that he or she is on the independent level.

The instructional level on the other hand, is the level wherein students comprehend with appropriate instructional support. Students who are on this level need the assistance of the teacher for them to comprehend or understand what they are reading. If the students encounter a lot of unfamiliar concepts and words, this means that his or her prior knowledge is also limited.

The frustration level is the lowest level wherein even with instructional support the reader fails to comprehend adequately. If the student finds the reading text too difficult even with assistance he or she is on the frustration level, meaning the learner cannot find meaning and relevance into what he/she is reading.

The fourth level which is not in the source cited is the borderline level, or the stage when learners are neither in the instructional nor independent level, and there is still a chance that they may step higher to instructional or fall to the frustration level. Barr, Bates, Blachowicz et.al. (2007) state that students who are neither in the acceptable instructional level or borderline level need to be helped through proper instruction and exposure to reading such as peer or group

reading, taped reading guides, or guided reading by the teacher to avoid their going down to the frustration level.

However, in the collegiate level, borderline is a problem because the main focus of students in this level of study is not on their general reading level but on their specific discipline's depth and breadth of content so that they can hurdle the major subjects in their field. The researcher sees this as a problem for comprehension greatly matters in the cognitive development and understanding especially in the major subjects offered to them. The students should have attained a certain level of mastery of their specialization considering the fact that they are already in the fourth year of their studies and nearing the taking of national licensure examination.

Table 2. Reading Comprehension Level before Reading

Student Number	RC Score (/10)	Percentage%	RC Level	Student Number	RC Score (/10)	Percentage%	RC Level
1	8	80%	INS	21	6	60%	*B
2	9	90%	IND	22	5	50%	*B
3	8	80%	INS	23	7	70%	*B
4	7	70%	*B	24	9	90%	IND
5	6	60%	*B	25	4	40%	FRU
6	6	60%	*B	26	8	80%	INS
7	7	70%	*B	27	4	40%	FRU
8	7	70%	*B	28	7	70%	*B
9	8	80%	INS	29	4	40%	FRU
10	7	70%	*B	30	8	80%	INS
11	7	70%	*B	31	4	40%	FRU
12	5	50%	*B	32	7	70%	*B
13	5	50%	*B	33	8	80%	INS
14	9	90%	IND	34	8	80%	INS
15	7	70%	*B	35	9	90%	IND
16	6	60%	*B	36	8	80%	INS
17	7	70%	*B	37	8	80%	INS
18	5	50%	*B	38	7	70%	*B
19	5	50%	*B	39	5	50%	*B
20	5	50%	*B	40	8	80%	INS

Legend: IND- independent (90% and above); INS- instructional (75-89%);
FRU-frustration (less than 50%); **B- borderline (50-74%)**

Table 2 shows the pre-test reading comprehension level of 40 senior college engineering student respondents of the study. Arranged from the highest reading level, 4 or 10% of the respondents were in the independent level (student number 2, 14, 24, and 35); 10 or 25% were in instructional level (student number 1, 3, 9, 26, 30, 33, 34, 36, 37, and 40); another 4 or 10% were in frustration level (student number 25, 27, 29, and 31); and finally, 22 or 55% were in the borderline (the remaining student numbers).

From the data, it can be said that more than half of the students were in borderline, one fourth was in instructional level, and only a few were in independent and frustration levels. The borderline was highlighted because this level was not included in McKenna and Stahl's (2009) reading level; hence, this was added in this study to point out a difference with that of frustration, although both of these are quite alarming in relation to the year level of the respondents who were supposed to possess wide knowledge with respect to their chosen field.

Table 4 summarizes the scores based on the reading levels of the students.

Table 4. Summary of Pre-reading Comprehension Level

Reading Level	Number of Students and %	
Independent	4	10%
Instructional	10	25%
Frustration	4	10%
Borderline	22	55%
TOTAL	40	100%

Only 10% of the students were in the independent level in relation to the technical text, a case study on strength of building materials, which was very much a part of their content and discipline. It means that these students can read and understand a reading text with the assistance of their instructor or teacher. However, with the demands in the collegiate teaching and the expectation on the respondents' adequacy of prior knowledge, this result was quite surprising. Nevertheless, the problem could be attributed to the language of the stimulus material which echoes the voice of an English native speaker. Perhaps the content was clear to the students when heard from a Filipino writer or written in the structure and manner of Filipino variety of English.

There were more students in the instruction than independent level, 25% of them, yet it could be said that this was below expectation since the students were supposed to have mastered their content by this time of their academic year. Worse, there were another 4 or 10% who fell under frustration level, and worst still was the number of borderline students, 55% of the respondents who apparently were quite shaky and unstable on the content knowledge expected of them in their area of specialization.

What could account for this is the language used in teaching as against the language of the written text or reference. Perhaps teachers/instructors explain their lecture and hold classroom instruction in Filipino or they speak English with their own version as they attempt to explain their point, contrary to the language of the stimulus material which was by a native speaker. Amato (1995) supported this view by saying that second language learners lack language exposure as native speakers of English have, so that even when the former has richer and more cognitive resources to use, their limited linguistic exposure poses a problem in processing a text, especially when it is a technical one.

It appears that a mismatch exists between the two languages (of the written text and the instructor's spoken text) and this places the college ESL students at a disadvantage, especially when the content or discipline is a universal thing yet the language in which it is written is but a second among the target users of the text. The text is supposed to be clear to those in and shared by the people in the field, but the language it uses does not consider the status of English in the readers' context. Perhaps the respondents knew the content but not the language with which it was written since English is only a second language to them.

It could also be said that perhaps the students were really not familiar to the technical text, and that their prior knowledge was not adequate to facilitate understanding. They could be familiar with it when heard from their teachers, but reading it on their own could be another matter. Maybe they were not used to reading a case study, but were more familiar with spoken delivery of content as narrated by the instructors.

Objective 2. Evaluate comprehension level after reading.

The same anticipation guide in the pre-test was given to the respondents after they have read the stimulus material. However, the statements were jumbled to avoid propensity of the students to memorization of the sequence and to provide a different exposure to the test.

Table 5 shows the post test scores and the reading levels of the students.

Table 5. The Reading Comprehension Level of the Students after Reading

Student Number	RC Score (/10)	Percentage%	RC Level	Student Number	RC Score (/10)	Percentage%	RC Level
1	8	80%	INS	21	5	50%	*B
2	8	80%	INS	22	5	50%	*B
3	8	80%	INS	23	5	50%	*B
4	8	80%	INS	24	7	70%	*B
5	7	70%	*B	25	6	60%	*B
6	7	70%	*B	26	7	70%	*B
7	8	80%	INS	27	9	90%	IND
8	4	40%	FRUS	28	5	50%	*B
9	5	50%	*B	29	5	50%	*B
10	7	70%	*B	30	7	70%	*B
11	7	70%	*B	31	7	70%	*B
12	8	80%	*INS	32	8	80%	INS
13	4	60%	*B	33	7	70%	*B
14	9	90%	IND	34	7	70%	*B
15	7	70%	*B	35	7	70%	*B
16	7	70%	*B	36	6	60%	*B
17	5	50%	*B	37	7	70%	*B
18	9	90%	IND	38	8	80%	INS
19	8	80%	INS	39	9	90%	IND
20	6	60%	*B	40	8	80%	INS

After reading the technical text, the respondents took the jumbled anticipation guide test to check whether the actual reading of the stimulus material would influence the comprehension level of the students.

Of 40 respondents, 4 or 10% of them were in the independent level (student number 14, 18, 27, 29); 10 or 25% were in the instruction level (student number 1, 2, 3, 4, 7, 12, 19, 32, 38, 40); one or 2.5% was in frustration level (student number 8); and 25 or 62.5% were within the borderline. After reading, the number of students in the independent level remained the same. Nothing was added to this level, but the students who got this level changed from the pre-test to the post-test, as was observed in other cases. Others had retained their reading level before and after reading, some had higher post-test than the pre-test, and still some had lower post-test than the pre-test level. 10 students or 25% were now in the instructional level, which showed an increase from only 4 in the pre-test; only one was in the frustration level, compared to 4 students

in the pre-test; and 25 or 62.5% were in the borderline, an increase in the number from 55% only in the pre-test.

To understand better the changes of scores in the reading levels from pre-test to post-test, Table 6 shows the comparative results between the tests.

Table 6. Comparison of Reading Levels before and after Reading the Technical Text

Reading Comprehension Level	Pre-test Result and Percentage		Post-test Result and Percentage	
Independent	2	5%	4	10%
Instructional	4	10%	10	25%
Frustration	6	15%	1	2.5%
Borderline	28	70%	25	62.5%
TOTAL	40	100%	40	100%

Table 6 presents the comparison of the pretest and post test results and the percentage equivalent. Whereas in the pre-reading there were only 5% of the students in the independent level, it increased to 10% in the post-test, a result showing an improvement in comprehension after they had been exposed to a technical text. This was also true for those in the instructional level with only 10% of the students in the pre-test, but it went up to 25% after reading. This indicated that reading served a facilitative function in comprehension among those who apparently were proficient in reading.

There was also a positive result for those who were in the frustration level- 15% in the pre-test, but it was reduced to 2.5% in the post-test. It should be recalled that this level is the lowest, where readers find a text very difficult that they could not read it on their own nor with

teacher assistance. This is not discounting the fact, though, that help is still in order for those whose reading level does not meet expectation of their specialization. Instructional adjustments and additional scaffolding could be planned before letting the students graduate and earn their diploma as specialist in their own field.

For the borderline level of readers, there were 22 or 55% of the students in the pre-test, but it increased to 25 or 62.5% in the post-test, a good indication of reading growth after a brief exposure to a technical text, only 30 minutes maximum to process and facilitate understanding of textual intents. But unfortunately, this case was not what it should be since the academic level of the respondents were supposed to manifest content mastery prior to a few months before graduation.

Considering all the limitations of data gathering for this study, it could be said that the role of prior knowledge served readers in different and various ways such that it appears difficult to make it the sole cause of comprehending or non-comprehending of the text, particularly in the genre and the language of the stimulus material used. It could be claimed though that the results seem to point out how prior knowledge tends to aid proficient readers construct meaning from texts.

A closer look at the individual results of pre- and post-test could serve as cases for understanding the nature and the role of prior knowledge specifically when processing a highly technical text such as the one used in the study. It could be surmised that although general reading strategies and metacognitive behaviors are utilized in every reading act, the processing is to be adjusted depending on the text, context, and reader factors (Cook, 1986). This is one lens to use in analyzing the changes of scores from pre- to post-test.

Table 7 depicts the individual respondent's level before and after reading, with additional data whether the levels changed, improved, or declined.

Table 7. Individual Student's Reading Level in Pre-and Post-test

Student number	Pre-test reading level	Post-test reading level	Retained Level	Post-test lower than pre-test level	Post-test higher than pre-test level
1	INS	INS	X		
2	IND	INS		X	
3	INS	INS	X		
4	B	INS			X
5	B	B	X		
6	B	B	X		
7	B	INS			X
8	B	FRUS		X	
9	INS	B		X	
10	B	B	X		
11	B	B	X		
12	B	INS			X
13	B	B	X		
14	IND	IND	X		
15	B	B	X		
16	B	B	X		
17	B	B	X		
18	B	IND			X
19	B	INS			X
20	B	B	X		
21	B	B	X		
22	B	B	X		
23	B	B	X		
24	IND	B		X	
25	FRU	B			X
26	INS	B		X	
27	FRU	IND			X
28	B	B	X		
29	FRU	B			X
30	INS	B		X	
31	FRU	B			X
32	B	INS			X
33	INS	B		X	
34	INS	B		X	
35	IND	B		X	
36	INS	B		X	
37	INS	B		X	
38	B	INS			X
39	B	IND			X
40	INS	INS	X		
Total			17	11	12

From the table could be observed the students who did not change their reading level even after their exposure to a technical text, 17 or 42.4% of them. In short, they retained the same level and the text was not useful in adding information or providing something that perhaps was already part of their existing background knowledge. Student numbers 1, 3, and 40 or 7.5% were in independent level still; student number 14 or 2.5% was in instructional level still; and student numbers 5, 6, 10, 11, 13, 15, 16, 17, 20, 21, 22, 23, and 24 or 32.5% were at borderline still. Apparently, there was no student in frustration level that retained the same after reading. These results could not help establish how prior knowledge influenced learning from or comprehending a text since no accommodation or even assimilation was observed among these students. Likewise, the varied levels of those retained students would show that perhaps a technical text was no respecter of reading level. There could be other factors that interplayed in the processing of a difficult textual content and linguistic specificity than prior knowledge alone.

There were 11 or 27.5% of the students that got a post-test score lower than their pre-test score, a manifestation of decline in reading level. Student 1 started with an independent level, but ended with instruction level; student numbers 24 and 35 were in the independent level before but slid down to instructional level after; one student (number 8) began from borderline to frustration level; and 7 students (numbers 9, 26, 30, 33, 34, 36, and 37) started from instructional level but went down to borderline after. What happened to these students could be a confusion when they began reading the technical text and started to doubt what they knew because what was presented perhaps sounded and looked different than what was stored in their schema. The content which the students seemed to know initially could be based on what they learned as explained to them and not as they read about it. Hence, when they encountered the same concept through another medium, they could have questioned their understanding. Perhaps their knowledge in the

discipline was not yet that strong such that this became shaky and uncertain when the same information was met in reading. Also, they could have failed to utilize their prior knowledge in an integrative manner that they forgot about it when they faced the post-test statements. Maybe they focused more on the textual information that they tended to ignore their knowledge so much so that they did not succeed to use this in aiding understanding.

There were 12 or 30% of the students that improved the reading level after the post-test. 6 or 15% started from borderline to instruction level (student numbers 4, 7, 12, 19, 32, 38); 3 or 7.5% began from frustration but went up to borderline (student numbers 25, 29, and 31); 2 or 5% had borderline level but went to independent level after reading (student numbers 18 and 39); and one started from frustration to independent level (student number 27).

The results from those that manifested improvement in reading level showed that reading exposure helped the students to learn from a technical text and that what they had before could be influenced by direct reading no matter how difficult the text might be. This suggests that limited schemata may be influenced when readers know how to accommodate incoming information and not just depend on their existing but limited or inadequate technical knowledge.

It could be reiterated too that the reading level prior to the actual reading of the text was not as important or helpful as the interaction taking place while processing a given text. What counts in this situation is the active engagement and interaction for meaning construction to facilitate comprehension.

Objective 3. Find out the difference between the pre and post test scores.

To find out the significant difference in the before- and after-reading tests, the researcher analyzed the data gathered using T – test for independent samples run with the SPSS Computer software. Table 8 shows the results of the statistical treatment used.

Table 8. Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 before	6.1500	40	1.45972	.23080
after	6.7000	40	1.52248	.24073

Table 8 shows the difference of the scores before and after reading the text, where (N) or 40 is the total number of sample. The before reading mean is 6.1500, while the post reading mean is 6.7000, a value which is .5500 lower than the after reading mean. The standard deviation before reading is 1.45972 and the post-reading standard deviation is 1.52248. The standard error mean is .23080 for pre-reading and .24073 for the post-reading.

The numerical value gained from the statistical treatment applied in the data could be interpreted descriptively as a big improvement in the post test after the samples have been exposed to the stimulus material, a technical text in civil engineering in the form of case study. Such improvement, however, needs to be further described to determine whether the improvement was significant.

Table 9 reflects the correlation between the statements in the anticipation guide and the technical text used as a stimulus material. Other information provided in table 9 shows the significance level of difference between the two scores.

Table 9. Correlation and Significance Level of Difference

Test	N	Correlation	Sig.
Pair 1 before & after	40	.482	.002

Table 9 shows that there is a .482 correlation between the two tests done. A significance level of .002 was also recorded and proved that there was a significant relationship between the reading text and tests administered. In statistics, the measure of significance should not be higher than .5 to determine that there is a significant difference. Hence, it could be said that there was a significant improvement in the after reading test from the pre – reading test based on the significance level of .002 which is lower than .5.

Overall, this shows that students gained some understanding and this changed their comprehension level after reading the text, despite the observation that when taken individually, a more detailed picture could be inferred. This also shows that although majority of them were on the borderline level, they could somehow find text congruence with their existing schemata, though this might not be enough to fully comprehend a technical text written in English, a second language among the respondents.

Chapter V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The last chapter presents the entire outcome of the study. The conclusion is analytically and systematically presented and then followed by the recommendations for future studies.

5.1 Summary

This research aimed to find out the relationship between prior knowledge and students' comprehension level before and after reading a technical text written in English by a native speaker.

A case study on civil engineering subject was used as stimulus material, the readers' knowledge of which was measured through anticipation guide before reading, and the jumbled anticipation guide after reading.

5.2 Findings

Based on the study, the researcher's findings are as follows:

1. Majority of the samples even though they are in the collegiate level still fall on the borderline level of reading comprehension, and very few are in independent and instructional reading level.
2. Students' prior knowledge on their field increases as they expose themselves to technical reading material related to their field of study.
3. A significant difference is seen in the pre- and post-reading test scores of the students after even a brief exposure to a technical text related to their specialization.

5.3 Conclusions

Based on the findings, it can be concluded that:

1. Most college students hardly show mastery of the content of their chosen specialization or field of discipline.
2. Exposure to a technical text even in just a short time allows for construction of meaning which reinforces existing prior knowledge or provides input for learning through accommodation. Prior knowledge plays an important role in the students' understanding and comprehension of a technical text. However, prior knowledge alone is insufficient to sustain comprehension. The interplay of other factors aside from prior knowledge equips readers with tools to facilitate understanding.
3. Discipline-related passages and selections for instruction and examinations affect the meaning construction process of readers. Hence, no reading text is really fit for all and therefore they cannot be used for all types of readers, specializations, and circumstances, especially for college students who have already chosen a particular field of study.

5.4 Recommendations

Based on the conclusions drawn, the following are recommended:

1. Conduct comparative study of two technical fields to see the difference between the levels of the learners' understanding based on their familiarity with content.

2. Triangulate the results of the study with an interview and case study to deepen the understanding on prior knowledge and its role in processing technical texts.
3. Use other genre of technical texts such as abstract, scientific report, and journal articles as stimulus materials to measure prior knowledge and depth of content knowledge in specific disciplines.
4. Try other instruments to check comprehension level before and after reading.
5. Compare the processing of technical texts and academic expository texts to point out strategies that help readers comprehend in both texts.
6. Use reading materials and tests that relate to the readers' field of specialization to avoid biases in results.

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