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Design for high-intensity reading in English as a Foreign Language

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DESIGN FOR HIGH-INTENSITY READING IN ENGLISH AS A FOREIGN LANGUAGE

A Project

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

in

Education:

Teaching English to Speakers of Other Languages

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Approved by:

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Dr. Dwight Sweeney, Second Reader

ABSTRACT

English reading is one of the most important academic tasks that most EFL students encounter when acquiring foreign-language proficiency. The primary aim of this project is to address the demonstrated need for effective English reading training for advanced speakers of English as a second language (EFL). Researchers have investigated many aspects of language acquisition; however, few studies have focus on EFL reading.

This project investigates a series of innovative teaching concepts that can be incorporated into EFL reading programs: computer-assisted reading, teaching reading as design, automaticity in reading, elaboration in processing, and input modification in EFL reading. Some contemporary teaching methods based on a theoretical framework regarding reading comprehension are also introduced, such as computer-assisted reading, modified reading, and speed reading. A method to evaluate the effectiveness of the instruction is provided. Finally, a theme-based lesson unit is presented that incorporates the theoretical framework to develop fluency in EFL reading.

ACKNOWLEDGMENTS

This project is dedicated to my wife, Yuan Ji, who encouraged and supported me to pursue and finish my higher education in the United States despite the stresses of living in another country and the subsequent financial hardships.

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CHAPTER ONE

INTRODUCTION

Background of Project

More than one hundred years ago, the first English language school was officially opened by the Chinese government to train ten men for the newly created diplomatic corps. Throughout the twentieth century, along with the increasing importance of English in global economic and academic domains, more people have recognized its prominent place in communication. In China, English is a compulsory subject introduced in elementary school. China annually recruits millions of instructors to teach English as a foreign language. English is taught throughout China's education system, including public and private kindergartens, primary schools, middle schools, high schools, universities, colleges, private business institutes, and training centers. Although China started teaching English at an early era, the outcome is far from satisfactory.

English as a Foreign Language (EFL) in China

English-as-a-foreign-language (EFL) learners in China are studying English in a country where English is neither an official nor a dominant language. Compared with

English-as-a-second-language (ESL) students in the United States, Chinese students have a much lower level of exposure to the English language. The realistic goal of their learning English is for academic or technical purposes (Barnett, 1989). As a result, the current English curriculum emphasizes the instruction of grammar and vocabulary to the neglect of functional English. Furthermore, the impetus of such an approach is increased by an emphasis on examination-oriented competence.

However, the government of China is designing a standard English course to improve the efficiency of teaching and learning. The new standard adopts some second-language-acquisition (SLA) methods and provides various proven strategies aligned with different levels of proficiency. The approaches are new to EFL students and most teachers as well. Therefore, it is imperative for teachers to become familiar with the related theories and improve themselves in order to master the new approaches.

The Complexities of Second-Language Acquisition

SLA theories have developed dramatically since the last century. Accordingly, target-language (L2) teaching methods have been evolving alongside the theoretical advances. For example, in the final decades of the nineteenth century, grammar translation was blamed for the

failure of foreign-language teaching although the approach had been practiced for years. The majority of language-teaching reforms in the late nineteenth century and throughout the first half of the twentieth developed in opposition to grammar translation (Stern, 1983). In the twenty-first century, SLA theory has expanded with additional dimensions and has increased in complexity as the result of rapidly developing technology, easier access to the Internet, and increasing worldwide intercultural interactions. It is predicted in the near future that SLA theory will continue to at a rapid pace.

The Problems in Reading English for EFL Students

In china, reading has been primarily viewed as translating rather than exploring meaning from the text. For most teachers, reading is one-on-one translation plus grammatical explanation. The practice has been repeated for years that students have forgotten that the fundamental purpose of reading is to seek meaning. They only expected to pass a test because that was the usual follow-up to reading. Furthermore, some students even felt that they were not required to understand the text. During acts of reading, students applied strategies to memorize the vocabulary that was always part of the examination. On the other hand, they paid less attention to the

organization and meaning of the texts. This situation occurred more frequently in listening and reading activities.

Purpose of the Project

The primary goal of this project is to provide a model of curriculum designed to teach reading to advanced EFL learners. A lesson unit is designed to aid in the development of reading fluency for the EFL learner through extensive reading activities that integrate elaborative processes and timed reading instruction.

Content of the Project

This project introduces contemporary teaching methods based on a theoretical framework regarding reading comprehension, and provides a theme-based lesson plan unit for the development of reading fluency in EFL learning.

Chapter One describes the background of the project and its significance. Chapter Two explores five major concepts: computer-assisted reading, teaching reading as design, automaticity in reading, elaboration in processing, and input modification in EFL reading. Chapter Three integrates the theoretical concepts explored in Chapter Two and provides a model of an innovative curriculum design for the development of reading fluency.

Chapter Four introduces a teaching unit based on the model interpreted in Chapter Three. Chapter Five provides both EFL learners and teachers with concepts and approaches of assessment. Finally, the Appendix B presents the instructional unit.

Significance of the Project

The unit of instruction, the Seven Wonders of the Ancient World, is designed to provide EFL learners with practical reading training that will facilitate the following outcomes: improved automaticity in reading; expanded understanding of culture; and improved elaborative skills in reading. This can be of value to learners who are advanced in English, including college students and those who want to improve their L2 reading beyond the beginning level.

CHAPTER TWO

REVIEW OF THE LITERATURE

Many teachers consider reading to be the intellectual foundation of academic work. Reading is an interactive process in which readers interact with texts by using what they already know to assist comprehension. For ESL and EFL students, reading is one of the most important academic tasks that they face. In recent years, researchers have investigated the reading processes of proficient readers. Leki(1993) found that successful readers focus on the communicative aspects of a text, that is, on its meaning. There are other researches focusing on how readers develop their cognitive domains through different input stimuli.

This chapter explores strategies and processes to improve ESL/EFL learners' reading comprehension by presenting research in computer-assisted reading, teaching reading as design, automaticity in reading, elaboration in processing, and input modification in EFL reading.

Computer-Assisted Reading

Computers are becoming an increasingly significant element in the teaching and learning environment. The relevance of incorporating computer technology in language learning has been highlighted by many researchers. This

paper will explore the history of technology used in education and review how computer technology has become no longer just a possible tool but an essential new medium of language and literacy practices alongside face-to-face communication and the printed page. As such, language professionals need to capitalize on the advantages and potential strengths that technology offers.

A Brief History of Technology Used in Education

The use of technology in American education dates back to the 1920s, when classroom speaker-boxes permitted administrators to make school-wide announcements (Cuban, 1996). Overhead projectors, introduced in the 1930s, made "the teacher's work easier by permitting him to sit before the class, facing pupils with all notes and materials for the lesson ready at hand" (Cuban, 1996, p. 2). According to Cuban, throughout history politicians and policy makers have embraced the use of technology for learning. Teachers also have embraced technologies such as the overhead projector, videocassette recorder, and copy machine (as well as the textbook) because they save energy and make teaching more efficient. On the other hand, technologies such as radio and film have enriched texts in the classrooms, which have enabled students to learn from different sources.

Computers were celebrated for their extraordinary power to enhance teaching and learning. Desktop computers in L2 instruction began to be used in the 1970's with the hope that technology would serve as a capable and resourceful tool for more efficient second-language (L2) acquisition. Some people were inspired to think schools could actually be eliminated in the future. However, some other teachers found the new technology barely met their efficiency criteria. These teachers hesitated to accept the new hardware and software. Research found that teachers used criteria forged out of their own experiences to decide which electronic tools they should use routinely (Cuban, 1996, p. 3). Cuban offered sample questions that teachers would ask if they were faced with new technologies:

> Is the machine simple enough for me to learn quickly? Can it be used in more than one situation? Is it reliable or does it break down often? If it breaks down, do I have to fix it or will someone else repair it? How much time and energy do I have to invest in learning to use the machine vs. the return it will have for my students? When students use the machine, will there be disruption? Will it maintain or

compromise my authority to maintain order and cultivate learning? (p. 1-2)

These questions accompanied the development of computer-assisted instruction (CAI). The endeavor to answer these questions drove the improvement of hardware and software of CAI. The questions underlying CAI also apply to computer-assited language learning (CALL).

Stages of Computer-Assisted Language Learning (CALL)

Computers have been used for language teaching since the 1960s. Warschauer and Healey (1998) divided the history of computer-assisted language learning into three main phases: behavioristic CALL, communicative CALL, and integrative CALL. Each stage corresponded to levels of technology as well as research in the field of educational psychology and applied linguistics (Brantmeier, 2003).

Behavioristic CALL was based on Skinner's stimulus-response theory. This mode of CALL featured repetitive language drills, referred to as drill-and-practice. The best-known tutorial system, PLATO, ran on its own special hardware consisting of a central computer and terminals and featured extensive drills, grammatical explanations, and translation tests at various intervals (Ahmad, Corbett, Rogers, & Sussex, 1985). SLA

theories in the 1960s were influenced by research in behavorist psychology. A significant contribution of behavioristic CALL was that students could progress at their own pace outside of the classroom (Brantmeier, 2003).

While new personal computers were creating greater possibilities for individual work in the late 1970's and early 1980's, the next stage of CALL--the Communicative Stage--emerged (Warschauer & Healey, 1998). At the same time, behavioristic approaches to language teaching were being rejected at both the theoretical and pedagogical levels.

Communicative CALL incorporated theories of innate language processing (Chomsky, 1959; Lenneberg, 1967). Chomsky maintained that every child is born with universals of linguistic structure "wired in." According to this view, children do not have to learn those features common to the structure of all human languages (universal grammar), for they are born with the basic framework of linguistic structure innately specified (Linfors, 1987).

Incorporating this theory, some programs were created that featured the particular set of expressions that one's community is using rather than linguistic codes. In other words, these programs deemphasized grammar learning.

Communicative CALL fit itself well with the other assertions of innatism: that learning activities should focus more on using forms rather than the forms themselves. Software was designed to teach grammar implicitly rather than explicitly. Fewer grammar-analysis practices were found in this software. The software also encouraged students to generate original utterances rather than just prefabricated sentences or paragraphs (Jones & Fortescue, 1987; Underwood, 1984).

By the late 1980's and early 1990's, the focus on language use in culturally authentic contexts led to the phase of integrative CALL, a perspective that integrates various skills and technology more fully into the language-learning process. This version of CALL offers a wealth of authentic language materials that required a combination of skills such as reading, writing, listening, and speaking. Students learn to use a variety of technological tools as an ongoing process of learning language as a whole. The use of multimedia enables a student to read, listen and watch through a single program. It allows learners to navigate their way around by pointing and clicking the mouse. Learning at one's own pace is an advantage of integrative CALL as is the possibility of moving back and forth between texts.

It was different from what students did before: "visiting the computer lab once a week for isolated exercises" (Warschauer & Healey, 1998).

In the last few years, the number of teachers using CALL has increased markedly. Although the average school still makes limited use of computers, it is obvious that a new stage has been entered in which a tighter link between technology and teachers-of-English-to-speakers-of-other-languages (TESOL) has been established. Although the development of the Internet brought about a revolution in the teachers' perspective, the Internet is gaining immense popularity in foreign language teaching and more and more educators and learners are embracing it.

CALL-Enhanced Target Language (L2) Reading Strategies

Different reading strategies influence the way readers process information and hence their comprehension. Magliano et al. (1999) revealed that readers tend to process the text according to the reading strategy they were following, so participants on the different conditions of narration, prediction or association produce more inferences corresponding to their conditions.

Research conducted by Sheorey and Mokhtari (2002) showed that ESL students were higher users of strategies than U.S. students. It is pointed out "skilled readers...are more able to reflect on and monitor their cognitive processes while reading" (p. 445). Programs for CALL have come a very long way since they were first developed over two decades ago. These programs tutor and drill students, diagnose problems, keep records of students' progress, and present materials. It is believed that they reflect what good teachers do in the classroom. ESL/EFL students are more likely to expect to benefit from CALL. These students feel more comfortable reading on-line, because they can learn at their own pace and convenience. In addition, they have opportunities to access vastly superior materials and personalized diagnostic tools. The research also indicates that those students' performances on exams and quizzes may be greatly improved if CALL is effectively integrated into curriculum.

In observing and describing reading activities in CALL situations, researchers have attempted to discuss learning strategies, conversation and interaction between learners, and interaction between learners and the computer. Windeatt (1986) reported that there were no substantial differences in the interaction among students

in CALL and non-CALL exercises, but his subjects used different reading strategies in the two tasks.

However, it is commonly believed that a properly implemented computer-assisted reading program enhances and encourages independent learning in the classroom in the following ways:

1) Improve attention and concentration while reading
2) Make reading a more active process
3) Increase personal involvement in the reading material
4) Enhance registration and recall of text information in memory

Students' interest and motivation in a subject is often fostered when one understands the reading assignments. Students will be better prepared for class, leading to improved class participation and ability to take more accurate and complete notes. In addition, as students gain proficiency in reading, self-esteem improves (Cooper, 1996).

Conventional and Computer-Enhanced Reading Environments

The RAND Reading Study Group indicated that the three elements of reading comprehension--the text, the activity

and the reader--occur within a larger sociocultural context (RAND Reading Study Group, 2002, p. xv). Conventional second-language teaching and textbooks are relatively unsuccessful for a significant number of learners primarily because of impoverished input in the target language, both with respect to quality and quantity. "When curriculum and content standards are set by external governing agencies, neither students nor teachers have complete freedom to study what they will" (Diaz-Rico, 2004). While in China, I met several teachers of college EFL classes in a meeting. They all complained that the textbooks were predetermined by school administrations. Some books did not integrate any SLA theories but consisted only of randomly compiled articles.

Teachers in many parts of the world want to be able to expose learners to authentic language on the meaningful topics that the students may face in their daily lives. The interaction is expected to be purposeful, which includes a real audience that is actively involved with the learner (Pica, 1987). However, in a traditional English class, learners have little opportunities to interact and negotiate meaning in the target language with an authentic audience. Reading activities are commonly considered as a preparation for an exam. It is thus

difficult to involve learners in authentic tasks, if there are any. Under the traditional reading approach, learners are not encouraged to produce varied and creative language but rather memorize the language structures in the texts. Therefore, the reading process is less meaningful than it is supposed to be.

In contrast to the traditional curriculum, curricula based on the Internet have become a very plausible means of supporting optimal language learning. Coiro(2003) outlined three types of texts that readers encounter online: nonlinear texts, multiple-media texts, and interactive texts. The last type provides more opportunities to interact with authentic audiences compared to the use of typical textbooks. The goal is to create interaction between the English learner and a knowledgeable source, such as stimulating discussion of a medical topic with a doctor or a legal issue with a lawyer. Dozens of websites publish content-based reading lessons that include the use of graphic organizers, on-site activities, schema-building frameworks, pre-reading and post-reading assessment, and so on. Some Websites provide many interesting free activities for students. For example, in one online activity, readers find a mystery posted and are encouraged to solve the

puzzle. In another activity, in order to make an educated guess, readers must read the text very carefully for clues. The user can select among texts linked to these activities to fit designated reading levels.

In a computer-assisted reading environment, it is easier to build knowledge bases at different levels for ESL/EFL students so that they will be more active in reading practice. The following characteristics are found in successful online reading programs, which are generally thought to be important among successful language programs: students read a variety of materials in terms of topic and genre; students choose what they want to read; the material students read is within their level of comprehension; students take part in post-reading activities; students receive immediate feedback from peers or other sources; and teachers provide help and guidance where needed (Kim & Krashen, 1997; Yu, 1993).

In sum, CALL is experiencing extremely rapid growth as more powerful and inexpensive computers open up new possibilities in artificial intelligence and teaching/learning. Multimedia computing, the Internet, and the World Wide Web have provided an incredible boost to CALL applications. However, technology in and of itself cannot be the focus of the changes that are needed. The

application of technology in language learning should be done in a manner that is consistent with sound pedagogical principles informed by SLA theory. Without this strong foundation, second language (L2) instructors will not be able to make principle-guided decisions in their instructional use of technological and computer-related tools.

Teaching Reading as Design

Reading as Design

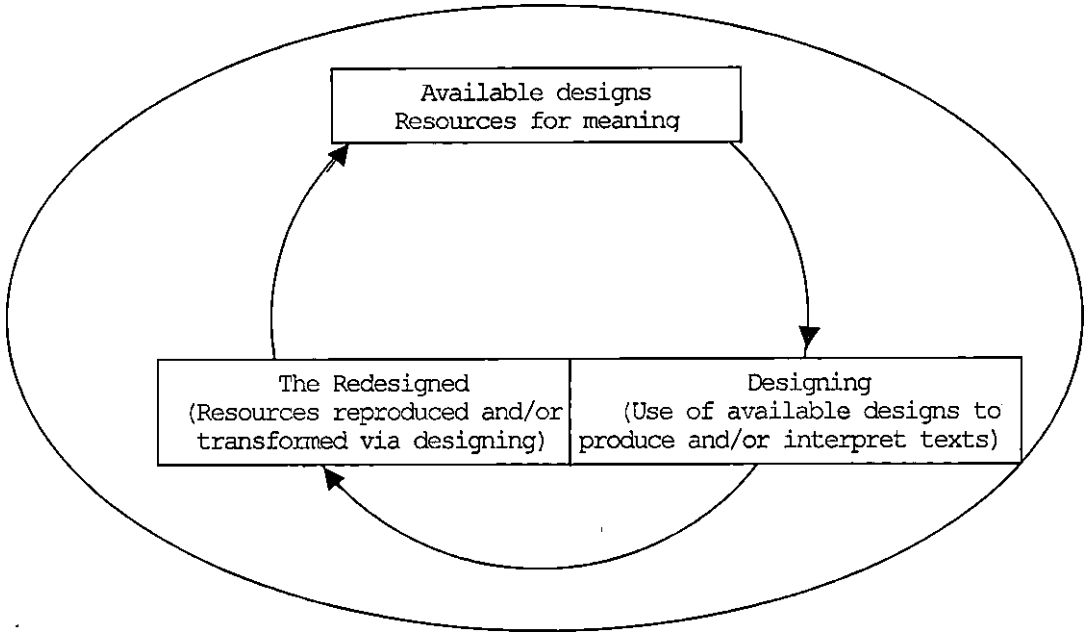
Reading is not as simple as an act of decoding and absorbing information, but involves creating and communicating with texts; it is a construction of meaning (Diaz-Rico & Weed, 2002). Therefore, language learning "is learning how to mean--in a sociocultural context in which the culture is itself constituted partly by language, partly by other semiotic (sign) systems" (Kern, 2000, p. 52).

Halliday (1978) described language as a system of choices and meaning potential. In other words, the purpose of reading is to explore and decode the choices made by the writer. According to this point of view, language education should shift its emphasis from grammar and structure drills to a more communicative mode that focuses

on learning how to mean and how to design meaning within a given social environment instead of only retrieving information from lines of print. The notion of design lies at the heart of communicative approaches to language learning. The New London Group describes it as follows:

> The notion of design connects powerfully to the sort of creative intelligence the beat practitioners need in order to be able, continually, to redesign their activities in the very act of practice. It connects well to the idea that learning and productivity are the results of the designs (the structures) of complex systems of people, environments, technology, beliefs, and texts. (Cited in Kern, 2000, p. 54)

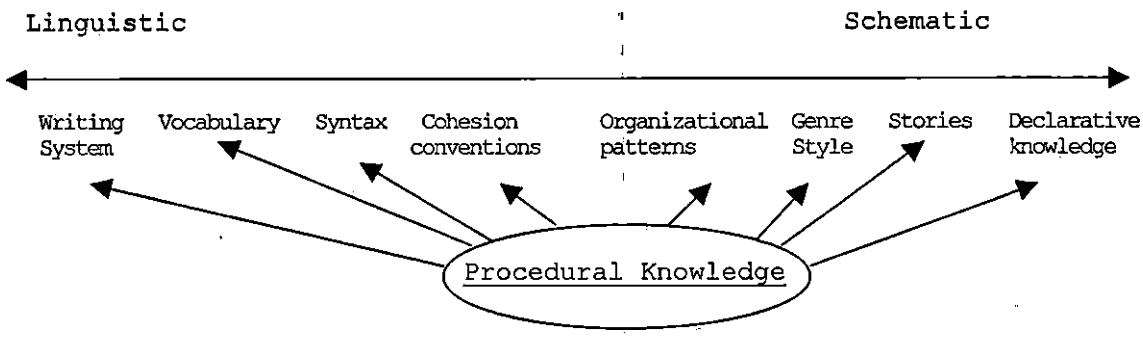
Available elements such syntax, lexicon, and patterns are used to produce and/or interpret texts. Then elements are transformed in producing new constructions; this step in the circle is called redesigned. The Figure 1 shows the relationships among available designs, designing, and the redesigned.



Source: Cited in Kern, 2000, p. 55
Figure 1. Design of Meaning

Available Designs of Linguistic Resources

Available designs, or meaning resources, are illustrated by the writing system, vocabulary, syntax, cohesion conventions, organizational patterns, genre style, stories, and declarative knowledge of language. These elements roughly organized along a continuum, with linguistic resources such as writing systems, vocabulary, grammar, and cohesion conventions at one end, and schematic resource such as rhetorical organization patterns, genres, styles, schemata, and stories at the other (see Figure 2). These available designs are all put to use in accordance with one's procedural knowledge.



(Source: Kern, 2000, p. 67)
Figure 2. Continuum of Available Designs on a Linguistic-Schematic Axis

In the linguistic scope, the available design of the writing system is often an immediate point of focus, as it serves as the entry point for vocabulary and grammar study (Kern, p. 68). The first thing that strikes EFL students is the way English sounds and the way it looks on paper. An adult ESL student in China generally has no problem distinguishing Chinese characters in their various styles (small seal, scribble, regular, running and cursive). For an English speaker, the Chinese writing system is hard to understand--the differences across these styles are much more striking than the resemblances. Some writing systems such as French and Spanish are closer to the language of English alphabet than is Chinese. For the same reason that English speakers feel overwhelmed looking at Chinese texts, students from an ideographic system are likely to be frustrated as they look at English texts.

Other available linguistic elements include vocabulary and syntax. Some students think vocabulary means words, and syntax means the order of words. They assume a one-to-one translation will squeeze the meaning out of the text. As a fact, this helps sometimes; but more often it does not. As stated in the previous part, language is about choice, including how to choose words from a range of possible synonyms to fit the social context.

> For example, in pointing to a man standing in a hotel lobby I can refer to him as 'that gentleman', 'that person', 'that guy', 'that brother', 'that bozo', 'that nerd', or any of a number of other ways--each expressing a different relationship and a different attitude. (Kern, p. 75)

Those expressions use simple words to refer to a simple object. Students do not need to look into their dictionaries for these familiar simple words; but if they do, dictionaries may not help them to understand the connotations better. Put together with other differences between Chinese and English, it slows down the speed of skimming, scanning, dictation, and note-taking in L2.

There is another related issue. When the learners are exposed to L2 texts, the teachers assume that students' systemic knowledge will be sufficient to guide their comprehension. When there is a breakdown in the comprehension process, it often presents itself as a linguistic problem, or teachers think it as linguistic problem. In fact, it can stem from absence of the relevant cultural knowledge instead of vocabulary or syntax (Nunan, 1991). This is one area of difficulty that teachers need to contemplate in the selection of texts for use with their L2 learners.

Reading as a Social and Individual Process

Meanings are not inherent in text itself; they need to be discovered. According to reader-response and schema theories, reading is a dynamic rhetorical process of generating meaning from textual, contextual, and knowledge-based resources (Kern, 2000). Each text should be considered as a particular act of design to discover either the relation between the reader and the writer or relation between the writer and the real world. It is the reader's job to bring whatever is available such as syntax, lexicon, and cohesion conventions to the act of reading to help locate the meaning; meanwhile, the reader

is invited to apply other designs to decode other meaning and relationships.

An example is the inauguration speech made in year 2000 by Shuibian Chen, the President of Taiwan. The People's Republic of China (PRC) sees Taiwan as a breakaway province that should be reunified, by force if necessary; whereas Mr. Chen tends to claim that Taiwan should be independent. There is disagreement and confusion between the PRC and Taiwan about the status of Taiwan, and even its proper appellation. In Chen's speech, neutral and even negative words can be found in representing the PRC in comparison to the positive words regarding Taiwan. Furthermore, it was noticeable in the 2000 inauguration speech that he preferred the term "Taiwan" than a more provocative name of "Taiwan Republic." His particular lexical choice (design) displayed a significant positionality between the "meanings" inherent within the choice.

The above example also makes the point that "reading and writing are always socially-embedded activities involving relationships, share assumptions, and conventions as well as individual, personal acts involving imagination, creativity, and emotion" (Kern, 2000, p. 112). Kern accounted for such factors by adding two

layers (the layer of immediate and eventual communicative context and the layer of sociocultural context) surrounding the layer of "available designs" (see Appendix A).

Looking at L2 from the perspective of design, reading and writing are not singular, unitary constructs, but rather culture-, context-, and task-depended constructs (Kern, 2000, p. 63). Therefore, it is fair to say the challenge for Chinese students to learn English is that English is not only a new script but also a new world.

Teaching EFL Reading as Design

Kern indicates one of the most fundamental and self-evident difference between literacy in the first and second languages is that the adult readers/writers of a second language have two languages at their disposal rather than just one (Kern, 2000, p. 117). Adult EFL learner are not blank slates, to the contrary, they lead complex lives full of thoughts, dreams, emotions, families, loyalties, problems, friendships, and enmities that can enrich their language life in L2 as in L1 (Diaz-Rico, 2004).

Although reading in L2 shares numerous important basic elements with reading in L1, the students' attitude towards reading in L1 and L2 differ greatly. Even knowing

the purpose of reading in L2 is more than answering questions, most EFL students might consider L2 reading as important only to pass quizzes and examinations because many EFL programs are highly exam-oriented. Thus, what kind of appropriate guidance the teacher can provide for the students to find the "sense" of texts is very important. Several strategies should be integrated to teach EFL as design, which are explained as follow.

Linking Form and Intent. The natural starting place is genre. Use reduced or elaborated version which presents important information in a genre that is involving interests and personal needs, such as a resume or love story.

Linking Language to Content. Kern (2000) suggests the next step is to establish the "facts" of the text upon which an interpretation can be built. Asking above-surface questions will help students locate the facts in the texts.

Linking Form and Meaning. Students will look more closely at the particular linguistic choices that the writer made. They will pay attention to voices (passive vs. active) and author's patterns. Teachers should give the students the opportunity to think about the "possible

implications of the formal features of the text, linking formal analysis to interpretive activity" (Kern, p. 163).

Focusing on Organization of Ideas. At this point, students will learn to analyze the organization of ideas and information in the text. After organizing the information, they might be able to discuss the concepts in the texts with their own personal conceptions. The discussion should focus on a larger sociocultural context in which the text is embedded.

Assessment. A study contends that educators should assess "students' global understanding through some kind of transformed practice" (Kern, p. 164). Suggested by Kern, the assessment includes summaries writing, thematic analysis, oral retelling, and rewriting from a different point of view. These activities raise the cognitive complexity of the students' tasks and challenge their abilities to interpret the original text employing the writer's designs.

In sum, understanding texts written in a foreign language is a significant challenge for most students. Studies contend that teaching reading is beyond merely finding facts in the texts. The concept of teaching reading as design has presented reading as a dynamic, interactive process of deriving discourse from text.

Accordingly, teacher should provide opportunities to have students rethink their interpretation in the light of their new knowledge and experience as well as recognize the pragmatic rules of the genre and purpose.

Automaticity in Reading

Automaticity Theory

Most EFL students face obstacles to reaching the same fluency levels as they have attained in L1 when they are reading in English. Many theorists believe that one of the elements that differentiates "good" from "poor" readers is through the measure of automatic responses to vocabulary and text comprehension. This "unconscious" response refers to the internal understanding of what is being read and the complete comprehension of appropriate vocabulary. This level of processing is also termed automaticity.

Gass and Selinker (2001) offered an example of the exchange of greetings in the hallway:

> Speaker 1: Hi.
>
> Speaker 2: Hi, how are you?
>
> Speaker 1: Fine, how are you?
>
> Speaker 2: Fine. (p. 210)

Compared with other conversations between L2 learners, the above conversational routine is so automatic

that most EFL/ESL students expend no effort in achieving the exchange. As interpreted by Gass and Selinker, when there has been a consistent and regular association between certain kinds of input and output patterns, one can say that the process is automatic. Examples include shifting gears on a car, playing a musical instrument, and speaking one's mother tongue.

There are at least two types of cognitive and memory processes: automatic and controlled procedures. For example, the use of articles in front of nouns is automatic for native speakers, but it requires increased attention for EFL student to learn. Schneider and Fisk (1983) explained the mechanisms of skill acquisition in terms of a contrast between these two types, as explained below.

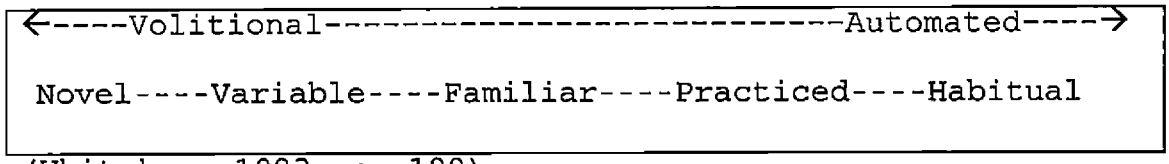
> Automatic processing is a fast, parallel, and fairly effortless process which is not limited by short-term memory capacity, is not under direct subject control, and is engaged in the performance of well-developed skilled behaviors. Controlled processing is characterized as a slow, generally serial, effortful, capacity limited, subject-controlled processing mode that

must be used to deal with novel or inconsistent information. (Schneider & Fisk, p. 120)

Automaticity Theory (AT) attempts to explain how people acquire skills as a function of the automaticity of operating processes. Notwithstanding various explanations of automaticity, a general view is drawn from these definitions: automaticity is a capacity to accomplish a performance without paying attention and independent from interference from other tasks. Singer(2002) defined automaticity by identifying the following elements: 1) gradually withdrawing attention, thus overcoming the problem of limited resources; 2) the ability to retrieve things from memory from a domain specific base; and 3) sufficient amounts of practice. He explained that the complex skill requires attention at first; but once people learn subsume it under the constraints of selective attention, it becomes automatic.

The Continuum of Automaticity

According to Whitaker (1983), the stages of behavior acquisition are best expressed as a continuum, not a dichotomy (see Figure 3). The continuum range from volitional to automated control.



(Whitaker, 1983, p. 199)

Figure 3. The Continuum of Automatization

Schneider and Fisk (1983) presented this change of behavior by describing the procedure of learning to play the piano. At the novice level, performance is very slow, serial, and capacity limited. The processing is controlled at this stage and the learner must allot much attention to each motor task. After substantial practice, however, the learner builds up a vocabulary of playable notes by consistent repeating. As the automatic productions develop, the performer can speed up the responses, incorporate more complicated rhythm information, and then finally play entire sections of the music by rote.

In learning to play a musical instrument, people start from the left end of this continuum. With sufficient practice and improvement, the learner gradually acquires the automaticity of a behavior and moves to the right along the continuum.

A study conducted by Schneider and Fisk (1983) showed how practice changes controlled processing into automatic processing. According to the researchers, automatic

production is modular and will develop when the component processes are consistent. They indicate practice can make automatic productions relatively free of limited memory resources and "automatic processing typically develops when subjects deal with the stimulus consistently over many trials" (Schneider & Fisk, 1983, p. 120).

In conclusion, automaticity can be acquired through effective, repeated practice. Practice makes productions autonomous, reducing direct conscious control of the subject, when makes it possible to process different stimuli at different stages simultaneously. When applied to reading, the theory has forced a focus upon the role of repetition as a primary factor that causes improvement in reading rate. The level of automaticity is believed to be a crucial point that separates good from poor readers.

Stages of Reading Development

Some people may wonder why comprehension would be stronger in second grade than in first grade. One answer might be that reading develops in stages. By studying the development of word identification and children's thinking, Chall (1983) suggested that children go through six stages as they progress as readers as follows.

Stage 0 - Prereading (Birth to Six). In the earliest stage, the child learns what is needed to be ready to

benefit from formal reading instruction, including phonological awareness, concept about print, alphabet knowledge, and language knowledge. The learner begins to develop insights into the nature of words and begins to realize that words are made up of sounds. Moreover, some of these words have the same beginning and ending sounds. A top-down approach to teaching reading, which follows a whole-language model, has shown positive gains in reading performance for the stage 0 reader.

Stage 1 - Initial Reading Stage (Grades 1-2.5). Age 6-7. The Stage 1 reader is attempting to break the code of print. They realize that letters and letter combinations represent sounds. They also become aware of vowels and vowel sounds. Teacher-directed modeling and instruction on the aspects of decoding is crucial during this stage. This is the one stage where whole language may not be the best approach for the instruction of reading.

Stage 2 – Confirmation and Fluency (End of Grade 1 to end of Grade 3). In Stage Two, the student learns to decode words fluently and accurately, as well as to orchestrate the use of syntactic and semantic information in text to confirm word recognition.

The ability to read fluently develops during Chall's Stage 2 of reading, which for most students occurs around

second to third grade. This is the last stage where the student is developing skills related to "learning to read." After this stage, the child will be required to shift to an emphasis on "reading to learn." The type of text being read shifts from being primarily narrative to expository and the language complexity of the written material begins to increase dramatically.

Stage 3 – Learning the New Single Viewpoint (Grade 4 to Grade 8). In this stage, children learn to use their reading skill to extract information from text. At this point, children begin to be expected to learn from content area textbooks, with increasingly less teacher guidance.

Stage 4 – Multiple Viewpoints (High School to Early College). In this stage, the student synthesizes information from different texts. Multiple viewpoints may be acknowledged, but still remain separate from one's own.

Stage 5 – A World View (Late College to Graduate School). In this stage, adults develop the selectivity to weigh information and selectively add information from text to their worldview. In turn, their worldview may be modified by what they read.

This stage-model was developed partly to explain how reading develops and partly to explain that different instruction is needed at different stages. It also implies

that reading automaticity is built through stages and previously acquired skills. Students must demonstrate the reading skill accurately; once reading is accurate, fluency develops through plentiful practice in which the task can be performed with a high rate of accuracy.

Reading Activities which Promote Automaticity

Repetition or rote rehearsal is a technique people use to try to remember and learn something. However, in order to be effective, repetition must be done after the forgetting begins (Atkinson & Shiffrin, 1968). Several aspects regarding building reading automaticity will be discussed separately as follows.

Phonemic Awareness. Automatic reading involves the development of strong orthographic representations, which allows fast and accurate identification of whole words made up of specific letter patterns. English orthography is generally alphabetic in nature and initially word identification is based on the application of phonic word attack strategies (letter-sound association). These word-attack strategies are, in turn, based on the development of phonemic awareness, which is necessary to learn how to map speech to print (Frith, 1985).

Therefore, learners who are preliterate or literate in a language with a non-Roman alphabet should be given

opportunities to develop letter recognition and sound-symbol correspondence skills. This should not be done in isolation, but with familiar texts that they have practiced orally or heard before (Hood, Solomon and Burns, 1996). Especially, L2 learners who are literate in their own language may find phonics instruction unproductive unless differences between their native language and English are pointed out.

Vocabulary Development. Vocabulary development also plays a important role in automaticity development. Even mild difficulties in word identification can pull attention away from the underlying meaning, reduce the speed of reading, and create the need to reread selections to grasp the meaning. Contrary to unknown words, known words will be perceived rapidly. Less attention will be required, and attention can be directed toward understanding the complete thought represented by all the words in the sentence (Carver, 1990). In texts where vocabulary may not be familiar, teachers can introduce key vocabulary in pre-reading activities that focus on language awareness, such as finding synonyms, antonyms, derivatives, or associated words.

Extensive Reading. Reading extensively means reading widely and in quantity. It means reading large amounts

(often of what are found intrinsically interesting) with the main aim of getting a global understanding of what is read. By reading extensively, learners recognize that they can improve their vocabulary and comprehension. It is important for learners read something they are interested in and easily understand. Extensive reading for a sustained, uninterrupted period of time is not only valuable for developing vocabulary but is also an important way to develop reading proficiency and language acquisition in general (Krashen, 1993). Ronan Brown (2000) insists that the more learners read, the more skillful and fluent they become He also points out that extensive reading helps learners to build their reading speed, accuracy and automaticity in reading of already known language.

Use of Speed Reading in EFL Class to Develop Automaticity

Speed reading is more than just reading as fast as one can; it is a process of implementing various elements from reading theory to make it work more efficiently and effectively. This will be explained below.

Klaeser (1977) presented four positive suggestions for gaining a faster reading rate: 1) Students can save time by increasing reading speeds. Consequently, their

negative feeling of reading as an endless task decreases; 2) compared with a relaxed reading process, speed reading enables readers to concentrate better which leads to greater comprehension; 3) with the increase of speed and comprehension as well, academic grades tend to rise; and 4) speed reading fosters students' positive attitude toward reading, which promotes greater extensive reading, further resulting in increasing reading speed and comprehension.

As students practice speed reading, they become more automatic in their response. With increased reading rate and motivation for extended reading, students will encounter frequent and repeated vocabulary, which will transfer to other areas of language skills development. Therefore, in speed reading, the re-occurrence of certain, frequent vocabulary causes it to be internalized, which ultimately aids in the speed and comprehension of reading materials.

In sum, automaticity is the ability of readers to perform complex skills with minimal attention and conscious effort (Samuels & Flor, 1997). Automaticity of reading develops through stages with repeated practice. The context and the appearance of words can affect the development of automaticity. Several suggestions are given

for using speed-reading exercise to improve automaticity. In these ways, teachers can help students to increase recognition of words and phrases, to retrieve word meaning from the mind while reading, and to create accurate comprehension of a texts' intended meaning.

Elaboration in Processing

Information Processing Overview

Information processing emphasizes cognitive structures built by the learner. Different people have different kinds of information-processing methods, some at a high level, some at a medium or low level. Several aspects cause these variations. Intelligence plays an important role in how a person processes information. Higher-level information-processing structures would be more intelligent if intelligence is measured by the amount of information that can generated by new rule combinations (Driver, Schroder, & Streufert, 1967).

Another aspect could be people's attitudes. This creates different results from person to person on their level of processing. "It is well known, for example, that two persons may express the same attitude but use it differently in thinking, arguing, and decision making" (Driver et al., 1967, p. 8).

The study on memory - the storage and retrieval of information - has been a primary focus on information processing research. It was promoted by George Miller as he definite Learning as a change in knowledge stored in memory (Miller, 1960). Cognitive psychology represents the dominant approach in memory studies of today. There are various views within cognitive psychology with different models. However, most cognitive psychologists agree with some basic principles introduced by Miller (1956):

1. The mental system has limited capacity. This means that the amount of information that can be processed by the system is constrained in some very important ways.
2. A control mechanism is required to oversee the encoding, transformation, processing, storage, retrieval and utilization of information.
3. There is a two-way flow of information as we try to make sense of the world around us.
4. The human organism has been genetically prepared to process and organize information in specific ways.

Miller also provided two theoretical ideas that are fundamental to cognitive psychology and the information-processing framework. The first concept introduced by him is "chunking" and the capacity of short-term memory. As he claimed, the short-term memory could only hold 5-9 chunks of information (seven plus or minus two). Chunk is termed as any meaningful unit; it could refer to digits, words, chess positions, or people's faces. The concept of chunking and the limited capacity of short-term memory became a basic element of all subsequent theories of memory.

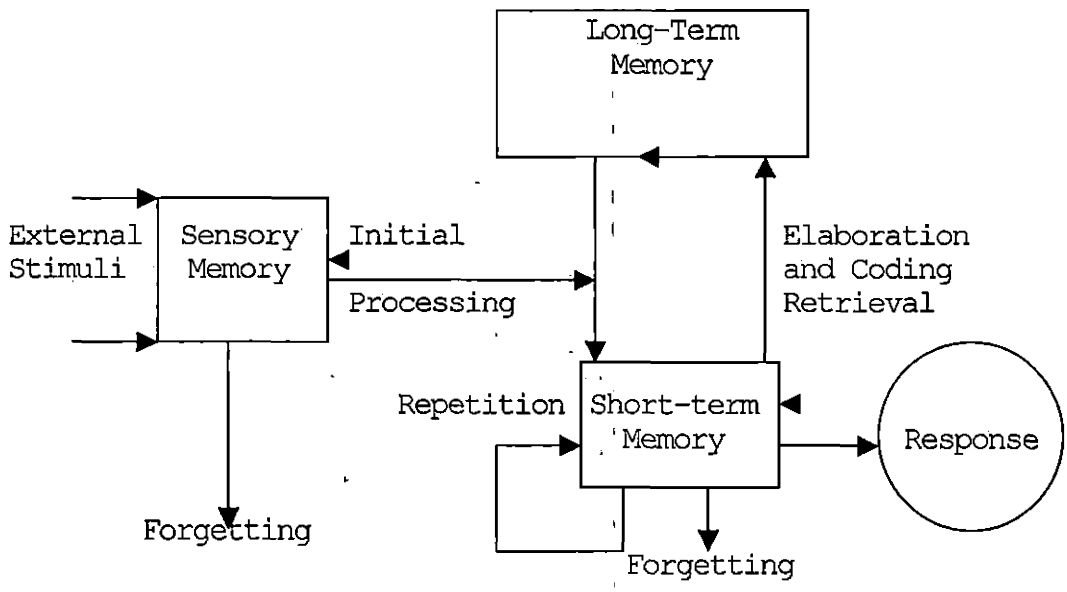
The second concept is TOTE (Test-Operate-Test-Exit) proposed by Miller, Galanter, and Pribram (1960). Miller et al. suggested that TOTE should replace the stimulus-response as the basic unit of behavior. In a TOTE unit, a goal is tested to see if it has been achieved and if not an operation is performed to achieve the goal; this cycle of test-operate is repeated until the goal is eventually achieved or abandoned. The TOTE concept provided the basis of many subsequent theories of problem solving and production systems.

Since the middle of the 20th century, information-processing theory has become a general theory

of human cognition; the phenomenon of chunking has been verified at all levels of cognitive processing.

Stage Model of Information Processing

According to Miller (1956), information processing is governed by internal process rather than by external circumstance. He introduced notion of process of selecting information (Attention), translating information (Encoding), and recalling that information when appropriate (Retrieval). There are several models to interpreter the process. The dominant view is labeled the "stage theory" which is based on the work of Atkinson and Shiffrin (1968) as showed in Figure 4.



(Source: Based on Atkinson & Shiffrin, 1968)
Figure 4. Stage Theory

This model proposes that information is processed and stored in three stages:

Sensory Memory (STSS). Sensory memory is affiliated with the transduction of energy from one energy from to another. Despite all types of change of energies, the brain only understands electrical energy through sensory receptor cells. In the process of transduction, a very short (seconds) memory is created.

Short-term Memory (STM). Short-term memory is also called working memory and relates to what we are thinking about at any given moment in time. It is created by our paying attention to an external stimulus, an internal thought, or both. That is, created consciously. It will initially last somewhere around 15 to 20 seconds unless it is repeated. Another major limit on information processing in STM is in terms of the number of units that can be processed an any one time. Miller (1956) gave the number as 5-9 chunks.

Long-term Memory (LTM). On this stage, information is relatively easily recalled although it may take several minutes or even hours. Elaboration and distributed practice such as periodic review in the direct instruction model are two processes most likely to move information into long-term memory.

Memorization versus Elaboration Strategies

Elaboration has the function of moving information into long-term memory where the information can be retrieved unconsciously. There are two ways that this is accomplished. The first is to use elaborations committed to memory in order to retrieve the required information. A subject could recall other relevant information about the target proposition without actually recalling it first time. Then the subject would recall the proposition. The second way is by recalling the elaborations committed to memory. The subject might not actually remember the proposition, but would be able to imply what it might be. Elaboration improves the memory in the following ways:

1. It increases the redundancy of interconnections among the to-be-remembered information.
2. It imposes an organization on the information that can be used to guide the retrieval process.
3. It can increase the number of contextual elements that will overlap between study and test (Bobrow & Bower, 1969).

Some memorization strategies such as reading material aloud several times and learning key terms are important in many tasks, but they commonly lead to verbatim representations of knowledge. Information being stored as

short-term state in the memory with little further processing. It is commonly believed that the more repetition, the more information will move to the long-term memory zone.

In regard to the effectiveness and achieving understanding, elaboration is considered more helpful. Bobrow and Bower (1969) used a memory test on subject-verb-object sentences. Results showed that the participants had to think harder when creating their own sentences, hence their elaborations and depth of processing. During the process of elaboration, new information tends to be integrated into a learner's prior knowledge base. For most effective memory, it is best to concentrate on higher-level elaboration.

Other research conducted by Organization for Economic Co-operation and Development (OECD) shows a comparative result regarding memorization and elaboration strategies. In the study, students were asked separate questions on their use of memorization and elaboration strategies. Based on their responses, an index was created for each of these two learning strategies as follows.

Memorization Strategies Index

- Try to memorize everything that might be covered
- Memorize as much as possible

- Memorize all new material so that one can recite it Practice by saying the material to oneself over and over

Elaboration Strategies Index

- Relate new material to things I have learned in other subjects
- Figure out how the information might be useful in the real world
- Try to understand the material better by relating it to things one already know
- Figure out how the material fits in with what students have already learned. (Source: http://www.pisa.oecd.org/knowledge/annexa/a2.htm)

The result shows that frequent use of elaboration strategies tends to be positively associated with performance on the combined reading literacy scale. The data suggest that elaboration strategies are more strongly related to student performance than elaboration. They may thus be more important than straightforward memorization strategies, which students might use more intuitively.

Elaborative Activities

In close connection with the cultural and educational context of the country concerned, teachers should provide

opportunities for students to elaborate on new information such as connecting new information to something already known, looking for similarities and differences among concepts, etc. Two elaborative activities, elaborative rehearsal and elaborative integration, will be discussed separately.

Elaborative rehearsal is simply a way of linking related ideas together. It is a type of rehearsal proposed by Craik and Lockhart (1972) in their Levels of Processing model of memory. In contrast to maintenance rehearsal, which involves simple rote repetition, elaborative rehearsal involves deep semantic processing of a to-be-remembered item resulting in the production of durable memories. In such a way, redundant retrieval routes are provided for recall.Some other cues will come logically to mind when students are trying to access the information. The process involves two parts:

1. Rehearsal part - Going over material through a variety of modes of repetition.
2. Elaborative part - Defining terms, comparing and contrasting ideas, writing summaries, choosing personal examples, and generating questions, looking for relationships between ideas.

The purpose and goal of elaborative rehearsal is to allow students to practice recalling and communicating fluently through written or oral language activities. Elaborative rehearsal practice the actual process engaged in during an exam. That is, long-term memory.

Elaborative interrogation is another simple strategy to enhance memory for facts. Elaborative interrogation involves turning facts to be learned into why-questions and then answering them. Elaborative interrogation is a straightforward strategy and involves three steps:

1) Read the fact to be remembered

2) Turn the fact into a why question

3) Answer the why question

Elaborative interrogation is a useful strategy when students need to understand the information as well as remember it. As confirmed by McDaniel & Donnelly (1996), the method has proven effective for significant improvement both in factual and inferential learning. In addition to that, the strategy is more effective when students are trying to confirm the fact, regardless of whether they are using general or specific information (Martin, 1991).

Woloshyn et al. (1994) found that appropriate use of elaborative interrogation could enhance remembering by

connecting new information with existing knowledge that is consistent with the new information. On the other hand, the effectiveness of the strategy has been found rely on prior knowledge. Martin (1991) advocated elaboration is a very effective strategy, but it requires that the student to have sufficient background knowledge about the subject to answer the questions. Furthermore, new information tends to be poorly learned when existing beliefs contradict it (Woloshyn et al., 1994). Developmentally, the elaboration strategy seems to increase in power, as the students get older. The potential pitfall in using this strategy with young children is that they may not possess enough prior knowledge to generate an answer to the why question.

In sum, elaboration strategy may enhance long-term memory and engage students better in the reading process. To use this strategy, students must activate existing knowledge and thus clarify the relationship to the new information. Elaborative rehearsal and interrogation are proven strategies to promote elaboration in class settings.

Input Modification in Reading

Comprehensible Input in Second-language Acquisition

Most of the studies on input comprehension have developed from Krashen's (1980, 1982) Input Hypothesis which first claimed the importance of comprehensible input in SLA. The Input Hypothesis claims that in order for L2 acquisition to proceed, learners must be exposed to target language data that they can access – what Krashen termed comprehensible input. He identified comprehensible input as "the only causative variable in SLA" (Krashen, 1981, p. 57).

Notwithstanding its significant influence, the Input Hypothesis has been challenged by a number of researchers. The distinction between input and intake, first proposed by Corder (1967), has been widely discussed by SLA researchers. He implied that intake plays a more important role than input in SLA. He asserts that input is circumspect to all of the target language elements available to the learner; whereas, intake is a subset of the input that actually goes in and is manipulated in some way by the learner. Another study indicated that there are other sources to achieve SLA besides comprehensible input that is stated as the sole element. According to White

(1987), it may be the incomprehensible input that provides important negative feedback to the learner, which consequently builds the L2 acquisition.

Swain (1985) also argued in her Comprehensible Output Hypothesis that in addition to comprehensible input, comprehensible output is also necessary for L2 acquisition. She states that learners will be obliged if communicative demands are put on them, therefore more comprehensible output is expected. This view contrasts sharply with Krashen's Input Hypothesis where the role of production, or output, is minimized.

However, Krashen's Input Hypothesis has been by far the most influential theory on the role of input and has had a huge impact in the history of L2 literature. Many theorists agree that comprehensible input plays a crucial role in L2 learning.

Modified Input

Given the importance of input comprehension in language acquisition, current SLA research has tried to identify what makes input comprehensible to the learner and its role in the language-learning process. Several studies were conducted to investigate effective ways to produce comprehensible input.

Gass and Varonis (1994) suggested that modified input yields better non-native-speaker (NNS) comprehension than unmodified input. Results of the study suggest that receiving modified input may temporarily help NNSs with comprehension. It was shown that NNSs produced fewer errors of comprehension when modified input was used than with unmodified input.

Long (1982) suggested four ways that input can be made comprehensible: (1) by modifying speech; (2) by providing linguistic and extra-linguistic context; (3) by orienting the communication to the 'here and now' and (4) by modifying the interactional structure of the conversation. Long asserts that all four ways may aid communication, but he especially emphasizes that modifying the interactional structure of the conversation most likely aids language acquisition.

There are two different kinds of linguistic modification available to the L2 learner. The first kind is characterized by input that has been simplified in some way before the learner sees or hears it. Teachers control the target texts by removing unfamiliar linguistic items such as complex grammar and new vocabulary. Teachers can reduce the sentence length and complexity. Typically, NSs speak more slowly, speak with clearer articulation, and

insert more pauses, when addressing NNSs than when they speak naturally. At the lexical level, Chaudron (1982) reported that NS teachers in four different school systems in Canada used high-frequency, "basic" vocabulary more often with ESL learners (NNSs) than with other NS students.

The second type of linguistic environment available to the learner is characterized by adding redundant information to the text with repetition, paraphrases, and appositions (Longs, 1996). Activities for elaborated input include repetitions, paraphrase or rephrase of words or sentences and story telling. We will discuss these types of modification separately as followed.

Simplification of Input

The importance of simplification made to L2 input has been underscored in SLA for its effects on facilitating L2 learners' comprehension. Furthermore, because simplified input facilitates comprehension, it indirectly has an effect on acquisition by providing learner's developing linguistic system with more grammatical information (Long, 1985). The notion of providing L2 learners with simplified input is intuitively appealing, but relatively little is known about how precisely simplification actually facilitate or comprehension. Even if simplification may

facilitate learner comprehension, it has a crucial weakness to achieve "real" comprehension because it has to reduce or remove necessary information that deters NS-like comprehension, as Yano et al. (1994) said:

> Removal of possibly unknown linguistic items from a text may facilitate comprehension but will simultaneously deny learners access to the items they need to learn. Linguistic simplification can be self-defeating to the extent that the purpose of a reading lesson is not the comprehension of a particular text, which learners are unlikely ever to encounter again outside the classroom, but the learning of the language in which the text is written and/or the development of transferable, non-text-specific, reading skills. (Yano, 1994, p. 191)

Honeyfield (1977) indicated that artificial, simplified texts for language learners lack features of authentic texts, and so simplified texts were considered a less-than-useful preparation for students learning to read in the real world. Driver et al. (1967) indicated that overly simple environments with insufficient diversity and information would fail to stimulate the processes of

integration. They believed simple structures were sufficient for coping with such overly simple environments (Driver et al., 1967); therefore, it is hard for an individual to be exposed to the right amount of diversity that is crucial for SLA. Additionally, Parker and Chaudron (1987) reported that linguistic simplification in the form of simplified syntax and vocabulary failed to have a significantly positive effect on comprehension.

Simplification has been widely applied in many commercially published L2 reading materials in the belief that the use of controlled vocabularies and short, simple sentences will serve to facilitate L2 reading comprehension (Yano et al., 1994). Commonly, simplified texts are considered easier to understand than unmodified texts. However, the issue of the role and effects of simplification on learners' comprehension remains contentious.

Elaboration of Input

Pica et al. (1987) found that simplifying texts language input was less effective in improving L2 learners' comprehension than providing them with the opportunity to ask questions and clarify their understanding of the authentic version. Yano et al. (1994) conducted another study to present learners with three

types of texts: unmodified, simplified, and elaborated. Their results showed greater comprehension for simplified and elaborated versions as opposed to the unmodified texts. In another comparative research, Parker and Chaudron(1987) extended this idea by suggesting that one should modify input in the direction of elaborative alterations rather than syntactic simplification. Some empirical findings support that greater comprehension may be achieved through linguistic elaboration rather than through linguistic simplification. These studies suggest more satisfactory results occur with elaboration than simplification. They argued that a decrease in the complexity of the input did not appear to be a critical factor in comprehension, and that interaction resulting in more complex input led to greater comprehension.

Frase (1975) found evidence for the benefit of elaborative processing with text material. Additionally, Oh (2001) conducted a study that looked at the comparative values of simplified and elaborated texts. Results show elaborated texts offers learners the access to positive L2 input that they need for language learning. Results also imply that simplification cannot meet language learner's needs completely. The researcher suggests that input should be modified in the direction of elaboration because

elaboration retains more native-like qualities and the elaboration form appears to offer learners a great deal of lexical and structural data that is necessary for SLA. A conclusion was drawn from the study that elaboration is equally successful, if not more successful, than simplification in improving comprehension.

However, not all forms of elaborations are equally beneficial towards different development stages. Evidence shows that different types of modifications may have differential effects for learners at various proficiency levels. Tsang (1987) investigated this tendency with 401 ESL students in Hong Kong. The researcher examined the differences in comprehension among the baseline, simplified, and elaborated texts with Cantonese-speaking students from Grades 9 through 13. The results for the lowest Grades 9 and 10 displayed significantly higher scores for the simplified and elaborated groups compared with the baseline group.

Use of Elaboration Input in University EFL Reading Class

Kern (2000) stated that because learners in academic settings ultimately need to learn how to read complex texts. As for literacy-based language program, Kern urged, "students need controlled task, not controlled text"

(Kern, 2000, p. 129). A technique called "PQ4R" that promotes elaborative processing of text may help to achieve such goal. The technique aims to create scaffolds to deepen domain knowledge and enable its access. The technique derives its name from the six phases it advocates for studying a chapter in a textbook. The sequence is as follows:

1. Preview.

   Survey the chapter to determine the general topics being discussed. Identify the sections to be read as units.

2. Questions.

   Make up questions about the section. Often, simply transforming section headings results in adequate questions. Pose question(s) about specific experiences that would lead to current topic, and then ask students to write (brainstorm) answers for several minutes. This will help facilitate group discussions. Finally, have someone record responses for everyone to see during the discussion.

3. Read.

   Ask students read the section carefully. Make them pay attention to the questions teachers have made up about it.

4. Reflect.

   Have students reflect on the text as they are reading it. Encourage them to understand it, to think of examples, and to relate the material to prior knowledge. Have learners take several minutes to reflect upon then write questions in a notebook (not turned in), or on a card (turned into facilitator), or web forum.

5. Recite.

   After finishing a section, ask students to recall the information contained. Have students reread the portions they had trouble remembering. Have them to tell a story about a relevant experience that will link to current subject.

6. Review.

   After students have finished the chapter, ask them to go through it mentally, recalling its main points. Again, let them try answering the questions the teacher made up. Have students

respond to a Web forum or chat after each session.

The central feature of the PQ4R Technique is the question-generating and question-answering characteristics. The most important aspect of these features is that they encourage deeper or more elaborative processing of the text material. Reviewing the text with the questions in mind is another important component of the PQ4R technique. Experiments seem to show that reviewing the text with questions in mind may be more generally beneficial.

In sum, this literature review indicates that modified input, both simplified and elaborated, enhances NNS comprehension. However, as been noted, not all types of modified input have proved to be equally effective. Research indicates that input simplification may facilitate comprehension for beginners, and elaborative modifications may be more suitable for advanced students. Certainly, educators also need to pay attention to complexity of pedagogical content knowledge as well as individual cognitive difference when applying the modifying strategy.

CHAPTER THREE

THEORETICAL FRAMEWORK

A Model of the Reading Process

The previous literature review suggests that several factors influence reading proficiency development in L2. Key concepts, including reading as design, information processing, elaboration in processing, and automaticity in reading, provide an opportunity to build a more effective theoretic framework to improve EFL reading (see Figure 5).

This model can be very helpful for EFL teaching in China. There are two separate types of reading instruction widely practiced in advanced EFL classroom in China: intensive reading and extensive reading. Intensive reading requires each sentence to be read very carefully to ensure the understanding of every word. New vocabulary terms and grammar structures are discussed before reading. Extensive reading is the opposite of intensive reading. Generally, teachers tend to ask students to read quickly for a general understanding. This is believed to be very helpful in getting students to manage a large mass of information. However, when students need to understand details, intensive reading is assumed to be more appropriate.

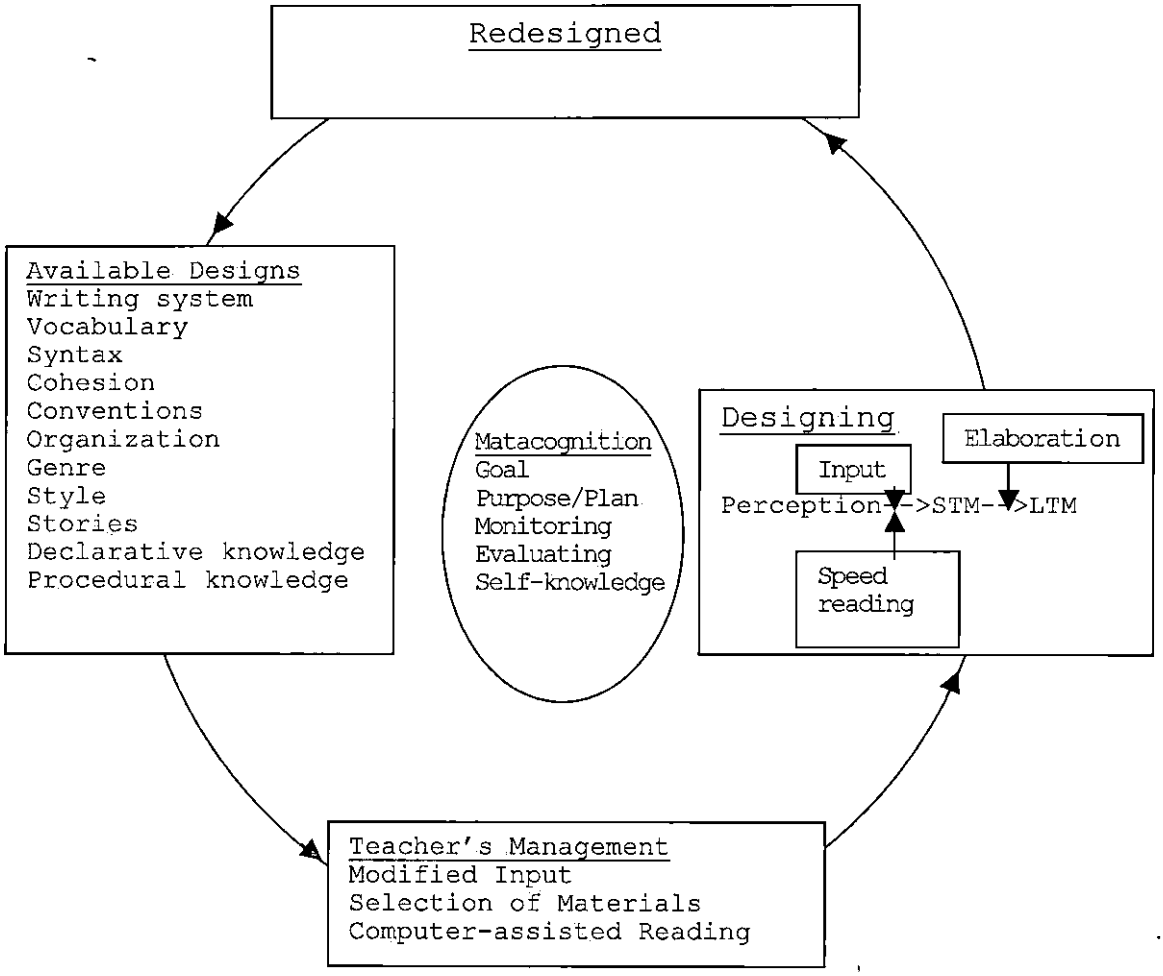


Figure 5. Theoretic Framework to Improve English as a Foreign Language Reading

Unfortunately, both approaches have drawbacks. In intensive reading, students have to slow down their reading speed and translate every word into Chinese. On the other hand, in extensive reading, students do not engage with the reading activity if they are already familiar with the content that they learned before in Chinese, which is their L1. Consequently, the separation

of these two types of reading into different classes only serves to increase student's dependence on L1.

Not only EFL teachers but also advanced EFL students need a reading model that combines intensive and extensive reading processes. High-intensity reading combines the advantages of the above two types and reduces the dependence on L1. Furthermore, this model unifies reading as design with information processing to increase efficiency in memorization as well as reading comprehension. The major features of the model will be explained in turn.

The High-Intensity Reading Model

The Reading as Design Cycle: Overview

Chapter Two has presented reading as a dynamic, interactive process of deriving meaning from text. High-intensity reading model will help students to learn that reading is a process whose particular product is contingent upon a variety of linguistic, cognitive, and social factors rather than a generic, all-or-nothing affair. The model has three stages: available designs, designing, and the redesigned. After practicing the process, students will recognize that reading is a recursive process instead of a linear process.

Available Designs

As stated in Chapter Two, communication involves the creative use of a stock of socially shared linguistic and cultural resources. Available designs provide the initial knowledge and patterns that allow reading to begin. However, once reading has begun, the act of reading commonly leads to modification or transformation of certain available resources. For example, when one's genre knowledge is formed in the act of extensive reading, his/her vocabulary may also be enhanced. The center part of this stage is increasing student's awareness of available designs, which include writing systems, vocabulary, syntax, cohesion conventions, organizational patterns, genre, style, stories, declarative knowledge, and procedural knowledge. Linguistic elements such as vocabulary, grammar, and writing systems are necessary but not sufficient resources for communicative language use, and yet these are frequently the only available designs addressed in English teaching. The high-intensity reading model balances the linguistic resources and schematic resources by engaging students in after-reading activities. The aim of this stage is to help learners to access more available designs, which serve as the base to create competent meaning.

Designing: The Information-Processing Paradigm

This model will teach students that learning a language is not so much a matter of learning the words of the language, but rather, a process of assimilation with learner's own expression, their own evaluation. In this stage, students practice applying designs to decode texts and seek meaning. Information-processing technique is integrated on this stage to enhance memorization and increase automaticity in reading, which leads to a better comprehension.

Input to Perception. Perception is the extraction of meaning from sensory input. At this level, learners are expected to be sensitized to stimuli; that is, they are willing to receive or to attend to them. This is the first and crucial step if learners are oriented to learn what the teacher intends for them to learn. For the most part, not all the input will transform to perception but only the attended input. Students need to be aware and willing to attend to the reading process. In this high-intensity reading framework, speed reading and other intensive activities will increase the attention to the topic and content; therefore more input can be extracted as perception and available for storage in short-term memory

which can be transformed to long-term memory by rehearsal and elaborative activities (Atkinson & Shiffrin, 1968).

Speed Reading. It is the belief of many teaching professionals that EFL students need to be able to read at a level comparable to a native speaker of English in order to keep up with an academic workload. The idea of this model is that through training in speed reading, students will increase their reading comprehension speed. This will better prepare them for the challenges they will encounter in their academic world. There are compelling reasons for implementing speed reading into a reading program as follows.

First, when speed reading, readers are forced to concentrate better, which leads to greater comprehension. Secondly, students will enjoy the act of reading more, which promotes more extensive reading, which in turn allows the opportunity for increased reading speed and comprehension. With increased reading rate and motivation for extended reading, students will encounter frequent and repeated vocabulary, which will encourage and expand their reading to other areas of language learning. Thirdly, speed reading promotes reading automaticity. Speed reading assests the re-occurrence of certain, frequent vocabulary to be internalized, which ultimately aids in the speed and

comprehension of reading materials. As students practice timed reading and are exposed to various language-learning elements, they become more automatic in their response due to the experience.

Some students' comprehension rates may drop when they are striving to increase their reading speed. This is usually the cause of rushed reading without applying techniques such as scanning, skimming, and organizing. However, it is believed that through an "effective" timed reading program, students can attain an increased reading rate, comprehension, and automaticity.

Automaticity as Effortless Elaboration. This reading model manipulates elaboration to a better memory. Redundant links are built during the elaboration activities such as creating questions during story-telling activities. Students will be able to recall other relevant information about the target information. The technique of PQ4R is suggested for enhanced elaboration. It helps students to retrieve messages stored in short-term memory and then effectively move them to long-term memory.

The elaboration process is a conscious procedure for most students. During this stage, teachers should have students become familiar with the technique and then provide opportunities to practice. After frequently

practice, their reading process will reach a certain level of automaticity, which will also benefit reading comprehension and rates.

Redesigned: a Part of the Reading Process

After interpreting the texts, readers in the designing process transform knowledge as they produce new constructions and representations about society. In other words, learners gradually acquire available designs by experiencing and using language in meaningful situations. Teacher should introduce the different interpretations coming from stage of designing. Students will understand reading is not only a social process but also an individual process. After evaluating the available resources and discourse, new resources can be produced by students and, in turn, become available for subsequent acts of meaning design.

The Role of the Teacher in the Reading/Design Process

It has become obvious that quality education will not be provided to all if teachers are not able to access the best methods for reaching for students' needs. Teacher management is important throughout the whole process. It appears more important to integrate teacher management at

the stage of available design because students' metacognition will function better for the latter stages.

Several strategies including modified input, selection of material, and computer-assisted reading are suggested to apply to teaching practice as a means of enhancing management. Those strategies also address students' cultural and ethnic needs, as well as their social, emotional, and cognitive needs.

Modified Input. Input refers to the target language to which the learner is exposed through listening, reading, and writing, which are considered basic aspects to acquiring the L2. Input modifications occur when learners need more specific details in order to comprehend both syntactically and semantically. When comprehension of input takes place from both semantic and syntactic processing, the linguistic characteristic of the input can become intake. Modified input consists of such features as simplification, elaboration, and regularization of input, which can make linguistic features more salient to the learners (Larsen-Freeman & Long, 1991).

As stated in the previous chapter, instructional modification has different functions in promoting learners at different levels. Simplification is good for

lower-level learners, whereas elaborated instruction is more effective for advanced learners.

Selection of Material. Content should be the primary focus of instruction. At the same time, academic language skills need to be developed and integrated with the content. This model benefits from incorporating content into the reading process. First, content provides students with an opportunity to develop important knowledge in different subject areas. Second, students are able to practice the language. Third, many students exhibit greater motivation when they are learning content than when they are learning language only (Chamot & O'Malley, 1994). It is important to study the same content recursively in order to understand how the same topic is repeated and presented in greater depth. The sequence of material is also worth studying because of the insight it provides into the structure of the discipline.

When teaching new information, teachers should link it to students' relevant prior knowledge. The link should be made explicit so that students understand that they are building on prior knowledge. New information is deliberately built level by level from knowledge, to comprehension, to application analysis, and finally to

synthesis and evaluation, thus developing the cognitive domain.

Computer-assisted Reading. Computers are becoming an increasingly significant element in the teaching and learning environment. The foreign-language teacher's task is to provide the students with a further code that can allow them to enlarge their cultural richness and proactively interpret the world around them. The potentials of the Internet, and information and communications technologies in general, can represent a tremendous support to the work of EFL teachers.

Internet resources can dramatically enlarge the variety of educational tools that a teacher can bring into the class. They allow teachers and learners to extend their access not only to resources devised for students and teachers, but also to authentic materials dealing with every type of content. Although not designed for educational purposes, these materials can be manipulated for educational purpose. Technology brings every type of information within reach and presents it in attractive and ever-changing forms, suitable and comprehensible to every level of language or content competence. It facilitates students to get in touch with different types of media,

texts, styles, and registers, so improving reading skills and language production.

In general, CALL gives to both teachers and students the possibility of promoting communicative exchanges and collaboration inside and outside the classroom.

Student Metacognition and Self Management

Readers' awareness of strategies during the reading process and their metacognitive awareness are essential for achieving their reading goals of this framework. The following are key-components of students' metacognitive.

Purpose/Goal. Students need to establish goals of reading at the beginning of practicing this reading model. The more clearly articulated the goal, the easier it will be for the learners to measure their progress. Devine (1983)'s results shown that younger and less-proficient readers tended to focus on reading as a decoding process rather than as a meaning-making process. Therefore, teachers must be aware that goals should be achievable and fit to readers' specific needs. Readers have differentiated concepts about their reading in L2.

Planning. Preparation and planning are important metacognitive skills that can improve student learning. By engaging in preparation and planning in relation to the learning goal, students think about what they need or want

to accomplish and how they intend to go about accomplishing it. Teachers can promote this reflection by being explicit about the particular learning goals they have set for the class and guiding the students in setting their own learning goals.

Monitoring. Metacognitive awareness also involves the awareness of whether or not comprehension is occurring, and the conscious application of one or more strategies to develop comprehension.

Self Knowledge. Metacognitive knowledge or awareness is knowledge about ourselves, the tasks we face, and the strategies we employ (Baker & Brown, 1984). Knowledge about ourselves may include knowledge about how well we perform on certain types of tasks or our proficiency levels. Knowledge about tasks may include knowledge about task-difficulty level. For example, in the area of reading, students know that familiar-topic material is easier to understand than unfamiliar material.

Evaluation. Second-language learners are actively involved in metacognition when they attempt to evaluate the effectiveness of what they are doing. Teachers can help students evaluate their use of strategies by asking them to respond thoughtfully to the following questions: (1) What am I trying to accomplish? (2) What strategies am

I using? (3) How well am I using them? (4) What else could I do? Responding to these four questions integrates all of the previous aspects of metacognition, allowing the second-language learner to undergo a process of reflection through the cycle of learning. Preparing and planning relates to identifying what is to be accomplished, whereas selecting and applying particular strategies relates to the question of which strategies are being used. The third question corresponds to monitoring strategy use, while the fourth relates to the orchestration of strategies.

There appears to be a strong relationship between reading strategies used by readers, metacognitive awareness, and reading proficiency. In the cycle of reading as design, students should apply metacognitive skills to retrieve available designs from which new designs can be formed. Evaluation during each step of the cycle is necessary, which can promote students' metacognition awareness that is also a crucial element of the model. The framework presented in Figure 6 unifies information processing theory, cycle of reading as design, and high-intensity reading activities into one recursive process. With carefully chosen texts, appropriate teacher management and students' metacognitive strategies, each of the above-mentioned factors no longer exists in an

isolated environment but rather works with each other to effectively improve students' reading speed and comprehension.

CHAPTER FOUR

CURRICULUM DESIGN

The instructional unit plan in Appendix B presents the Seven Wonders of the Ancient World. In this six-lesson unit, the students are guided through pre-reading activities, high-intensity reading, and after-reading activities. Their major work is to develop reading comprehension by applying appropriate strategies.

The instructional is structured as a ladder in which each step builds new knowledge on the prior bases—beginning with information that involves the recall of specific facts, counteracting with interpretation, explanation or summarization of a communication. Further, application is required which involves the use of mnemonic skills; as well as analysis, which is intended to clarify the writer's choices and indicates how the choices affected the writer's thought; and synthesis, the putting together of all prior lessons to create students' own criteria to construct new Wonders. Finally, students evaluate their success in all phases alone.

These lesson plans use many of the key concepts explained in Chapter Two very in effective ways. There are influences from Kern (2000) and his reading as design

notion, as well as key ideas from Krashen's Input Hypothesis. More concepts used in the lesson plan include steps from information processing, automaticity in reading, computer-assisted reading, use of the speed reading format, and elaboration of input.

The instructional unit is designed for advanced English learners such as college students. These concepts are not taught explicitly but rather implicitly. Most college students have the ability to see things in an abstract manner. "Skilled readers…are more able to reflect on and monitor their cognitive processes while reading" (Mokhari & Sheorey, 2002, p. 445). Students all asked construct meaning, applying prior knowledge to new information. They will not be able to have a concrete example of the Wonders of the Ancient World right in front of them. With the guidance from the teacher, they will need to seek the deeper meaning of each activity. After repeated exercises of this type, they will be able to develop autonomous ability to seek the abstract meaning of communications or activities.

As students take in information, the teacher has them elaborate on the information obtained. According to information processing theory, some information can be remembered by repeating it in maintenance rehearsal, but

in this lesson plan, the technique used to absorb information effectively is elaboration. With elaboration, students work with the information instead of just hearing it and trying to remember it. In this case, students start by getting a general sense about Wonders of the World, and then they apply what they have learned to choose a new Wonder of the World.

Imagery is an effective way of elaborating. In Lesson One, "Draw Pictures of the Seven Wonders," students have the opportunity to attach association, and give meaning to new information, therefore building a better memory about associated information.

This unit also provides an example of a research schema: presenting data--display the Seven Wonders of the Ancient World (Lesson One and Lesson Two); analyze the data--discover what makes a wonder a "Wonder" and list writer's category of the Seven Wonders of the Ancient Word (Lesson Five); applying data—develop one's own criteria to choose the Eighth wonder (Lesson Five). The unit provides a structure and organization which makes study of cultures meaningful.

Computer-assisted reading strategies are intergrated into the instructional unit. Lesson Two, Lesson Three, and Lesson Five have online reading components to help

students to process rich information. The teacher provides assistance during these reading activities. This is where the students are the ones who make sense of the world, with some assistance from the teacher. They work together as pairs while searching online; they interact with peers and teachers in order to construct meaning.

In summary, methods of EFL teaching and curriculum design should be regularly renovated to be reflective of the current research. The reading model introduced in Chapter Three combines the advantages of information processing theory and the reading-as-design cycle. This unit is built upon the model and integrates the key concepts of computer-assisted reading, teaching reading as design, elaboration in processing, modified input, and automaticity in reading.

CHAPTER FIVE

ASSESSMENT

Formative and Summative Assessment

Assessment is complex because it can not be discussed apart from other program issues. Teachers and administrations alike seek valid and reliable tests that can be used for program comparison.

Assessments may serve two complementary functions. In one context, the aim is prospective, or formative. The other context is retrospective, or summative. Here are some ways to think about the distinction further:

In formative evaluation, the goal is to provide feedback, with the aim of improving teaching, learning, and the curricula; to identify individual students' academic strengths and weaknesses; or to assist institutions with appropriate placement of individual students based on their particular learning needs.

Summative evaluation tests various aspects of instruction. Summative evaluation provides information on instructional efficacy -- to test its ability to do what it was designed to do. For example, did the learners learn what they were supposed to learn after using the instructional module? Summative evaluation is typically

quantitative, using numeric scores or letter grades to assess learner achievement.

Reading Assessment Methods

Reading assessment is currently undergoing substantial changes in order to reflect innovations that have taken place due to research on the reading process. Increasingly, reading is conceptualized as a dynamic, interactive, constructive process requiring thought and elaboration on the part of the reader. Most literacy assessments measure knowledge and performance by asking learners to choose the right answer on multiple-choice tests. However, this policy is misaligned with recent theories of reading and recent curriculum developments.

Overall, the assessment must be fair to learners, informative to teachers, and acceptable to policymakers. There is increasing support for assessments that show actual reading and writing performance as well as reading and writing processes--assessments such as interviews, surveys of literacy behaviors and practices, and portfolios.

The assessments that programs use can be divided into the following three categories: standardized

norm-referenced tests, materials-based, and program-based assessment. They are explained in detail as follows.

Standardized, Norm-Referenced Tests

To measure the achievement, knowledge, and skills of large groups of learners across programs, standardized norm-referenced tests is commonly used in China to assess reading comprehension in L2. One of the major reasons that standardized tests are widely used is because the tests do not require a great deal of training to administer, either for students and teachers.

Materials-Based Assessments

This type of assessment is often used in individualized instruction, such as tutoring or computer-assisted instruction, to place students in the appropriate skills levels and to check progress and achievement. Some EFL schools use it at the beginning of programs, which is called "placement testing" or "assessment testing."

Program-Based Assessments

In contrast to standardized assessment, program-based assessments engage students in programs of instruction by using quality literature as a basis for reading, comparing, reflecting, and writing. Emphasis is no longer on choosing a single answer from a multiple-choice format.

Emphasis is on reading. More emphasis is being placed on teacher observations, samples of student instructional products, and student self-evaluation. Meaningful collections of such observations, work samples, and reflections are assembled into portfolios, which document student achievement and progress in literacy.

Thus, program-based assessments reflect educational approach compatible with design-based reading and promote high-intensity maximizing performance along with the impact the program has on learners' lives. The instructional unit provided in this project uses this type of assessment to align assessment with instruction.

Drawbacks of Standardized Assessments

Although standardized assessments are widely used in current EFL reading programs in China, they may not properly match the language-teaching goals. Teachers feel compelled to "teach to tests" while students feel "learn to tests." The traditional multiple-choice tests do not tell learners whether the mistake is caused by lack of English vocabulary or faulty sentence structure, or not having enough experience with reading and writing to complete the task.

These tests also show a tendency to reduce the complexity of language and literacy learning. They do not reflect what has been taught and do not capture all the learning that has taken place, especially in the affective domain. The emotions students bring to learning--especially learning a foreign language--are integral to students' engagement and motivation. Therefore, stimulating affective outcomes is essential; and standardized assessments not only do not promote motivation, but they may actually impede motivation.

Assessments Used in the Instructional Unit

Many types of high-level assessments capture the full range of student achievement. Below is a listing of some suggested assessment methods that may be used to help gather information on student understanding in reading. The information may be used to help in preparing and designing lessons to enhance learning.

Portfolios

To show progress over time, teachers use student portfolios, formal or informal collections of student writing. A portfolio may take many forms, from photographs depicting student growth and understanding to a writing on a topic completed over a period of time. The instructional

unit included in this project requires the teacher gather all student work that depicts students' conceptual development.

Demonstrations/Presentations

Students explain and communicate their understanding of key ideas, concepts, and principles and abilities of processes, techniques, and skills in demonstations and presentations to their classmates. In Lessons Four and Five, students will explain their ideas and strategies to the class after the reading activity.

Informal Discussions/Conferences

Students work either individually or in groups for the purpose of assessing and gathering information on their understanding of concepts, disposition to learning, growth in abilities, and capacity to work in groups. In Lessons Five and Six, students will participate a class discussion after reading, which helps to clarify concepts and explore the meaning of the text.

Student Self-Reflection

Academic prompts are used to encourage students to look closely at their learning. In this instructional unit, the teacher asks students to write about their understanding individually, addressing the question, "Why should they study other cultures?" (Lesson Six). Such

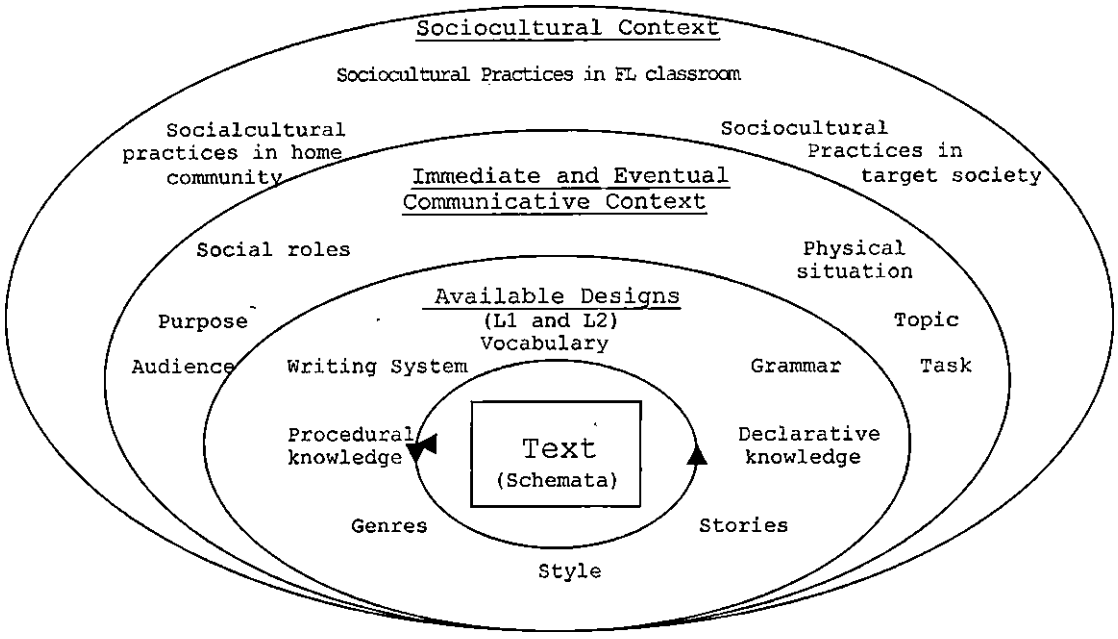
assessment will help students expand what they learned to the level of synthesis.

In sum, students as well as teachers demand meaningful assessments. These assessments should reflect on students' learning processes instead of simply promote memorization. It also means that language teachers will have a wider range of evidence on which to judge whether students are becoming competent, purposeful language users. Language programs that focus on various assessments are likely to instill in students lifelong skills related to critical thinking that build a basis for future learning, and enable them to evaluate what they are learning both in and outside of the language class.

This project has demonstrated that reading instruction, to be maximally effective with EFL learners, must incorporate high-intensity techniques based on the philosophy that a design-based program will enhance reading choices, increase speed and comprehension of text choices, and permit assessment to play a more specific role in reading redesign. Together the key elements of information processing theory combines with reading-as-design theory can be used to create an accelerated reading model for advanced EFL instruction.

APPENDIX A

SOCIOCULTURAL CONTEXT


Sociocultural Context
Sociocultural Practices in FL classroom
Socialcultural practices in home community
Sociocultural Practices in target society
Immediate and Eventual Communicative Context
Social roles
Physical situation
Available Designs
(L1 and L2)
Vocabulary
Purpose
Topic
Audience
Writing System
Grammar
Task
Procedural knowledge
Text
(Schemata)
Declarative knowledge
Genres
Stories
Style

APPENDIX B

LESSON PLAN UNIT

LESSON PLAN UNIT

The Seven Wonders of the Ancient World

Level: University/Advanced (English-as-a-foreign-language)

Standards:

Goal 1, Standard 3: To use English in social settings: student will use learning strategies to extend their communicative competence.

Goal 2, Standard 2: To use English to achieve academically in all content areas: Students will use English to obtain, process, construct, and provide subject matter information in spoken and written form.

Materials:

Posters of the Seven Wonders of the Ancient World
Ancient map
Modern maps
Access to the Internet
Kitaro's music CD
Focus sheets as stated in each lesson
Work sheets as stated in each lesson

Lessons:

Lesson One: Draw Pictures of the Seven Wonders
Lesson Two: The Math of Ancient Egypt
Lesson Three: History of the Wonders
Lesson Four: Understanding Collapse
Lesson Five: The 8th Wonder
Lesson Six: Why Do We Study Other Cultures?

Background Knowledge Requirements:

Basic computer skills including word processing and online searching
Competency in practical English

Lesson One:
Draw Pictures of the Seven Wonders

Objectives:

1. Read the article "Introduction to the Seven Wonders of the Ancient World"
2. Draw a reconstruction picture of the Ancient Wonders based on descriptions
3. Write a short paragraph to describe a picture

Materials:

Focus Sheet 1-1
Focus Sheet 1-2
Focus Sheet 1-3

Warm-up:

Brainstorm with the class about the ancient civilizations and the Seven Wonders of the Ancient World.

Task Chain 1: Read the article "Introduction to the Seven Wonders of the Ancient World"

1. The teacher shows a poster of the remains of the Seven Wonders.
2. Students read the article "Introduction of the Seven Wonders of the Ancient World" (Focus Sheet 1-1).
3. The teacher clarifies the selected vocabulary terms.
4. Students predict what the next paragraph will be about.

Task Chain 2: Draw a reconstruction picture of the Ancient Wonders based on descriptions

1. The teacher explains the task of drawing a reconstruction picture of the Ancient Wonders based on texts and pictures of ruins.
2. The teacher divides students into six groups.
3. Groups read and discuss the article about one of the wonders (Focus Sheet 1-2).
4. Students draw a picture based on the article and pictures of remains.
5. Upon finishing, the teacher displays the reconstruction pictures of the Seven Wonders.
6. Students compare and discuss their drawings and pictures.

Task Chain 3: Write a short paragraph to describe a picture

1. The teacher tells the class that they will write a short paragraph to enhance their memorization of the Seven Wonders of the Ancient World.
2. The teacher pairs the students. Each pair receives a picture of reconstruction of Wonders (Focus Sheet 1-3). They work together on a written description of the pictures.
3. When students finish, they can compare their writings with the article "Introduction to the Seven Wonders of the Ancient World."
4. Students are invited to read their paragraphs to the class.

Assessment:

Task Chain 1: Students self-evaluate these reading using rubric.

Score	Criteria	Comments
1 2 3 4	Reader demonstrates an accurate understanding of important information in the text by focusing on the key ideas presented explicitly or implicitly.	
1 2 3 4	Reader uses information from the text to interpret significant concepts or make connections to other situations or contexts logically through analysis, evaluation, inference, or comparison/contrast.	
1 2 3 4	Reader uses relevant and accurate references; most are specific and fully supported.	
1 2 3 4	Reader integrates interpretation of the text with text-based support	
	Total	/16

Task Chain 2: Each group will show their pictures to the class and discuss the strategies used to draw the picture.

Task Chain 3: Students will read their writings to the class. The teacher will circulate throughout the classroom to help students to complete the activity.

Lesson Two:
The Math of Ancient Egypt

Objectives:

1. Develop appreciation for ancient cultures by studying an ancient math method
2. Imagine the Egyptians' division methods
3. "Surf" online to complete a quiz about the ancient sciences

Materials:

Focus Sheet 2-1
Focus Sheet 2-2

Task Chain 1: Develop appreciation for ancient cultures by studying an ancient math method

1. Students read the article "Ancient Egyptians' Math (I)" (Focus Sheet 2-1).
2. The teacher writes division problem on the board and asks students to practice the method just learned.
3. Upon completion, the teacher calls one volunteer to demonstrate the correct procedure. Students check the accuracy of their own work.

Task Chain 2: Imagine Egyptians' division method

1. The teacher groups students into 4's.
2. The teacher writes on the board "How do you deal with remainders?" and illustrates how it is done with modern math.
3. Groups discuss and figure out how ancient Egyptians accomplished uneven division of numbers.
4. Class discusses the ideas coming out from the group activities.
5. Students read "Ancient Egypt Math Part II" (Focus Sheet 2-2).
6. Students practice division using the Egyptian method.

Task Chain 3: Complete a quiz of the ancient sciences by surfing online

1. Students log on the designated Website: http://www.pbs.org/wgbh/nova/sunken/wonders/sciclue2.html
2. Students work as pairs to finish the quiz online. They are asked to search for the answer

online using search tools. The teacher circulates throughout the classroom to help them with technical support.

3. The teacher leads a class discussion to give answers to the quiz.

Assessment:

Task Chain 1: Self-evaluation: After reading, use the rubric below to evaluate and comment on the activity. Students circle the score on the form.

Reading Criteria	Score	Comments
Make conscious connections between prior knowledge and text while reading to construct meaning.	1 2 3	
Verify and clarify ideas by referring to text.	1 2 3	
Recognize breakdowns in comprehension and repair these breakdowns by rereading, asking questions, and seeking clarification.	1 2 3	
Demonstrate fluent reading of grade-appropriate texts, applying spelling-sound word-recognition strategies and meaning-based word-recognition strategies as appropriate.	1 2 3	
Use knowledge of story elements (e.g., character, setting, mood, incident, structure) to interpret meaning.	1 2 3	

Task Chain 2: The teacher collects students' drafts to evaluate students' participation.

Lesson Three:
History of the Wonders

Objectives:

1. Study geographical developments of the ancient civilization by using maps
2. Study the history of the Seven Wonders
3. Write a short essay to explain relationships between geography and the historical development of the ancient wonders

Materials:

Ancient maps
Modern maps
Focus Sheet 3-1

Task Chain 1: Study geographical developments of the ancient civilization by using maps

1. The teacher lectures on the science of cartography.
2. The teacher clarifies the selected vocabularies.
3. Each pair locates the Seven Wonders and positions them on the map.
4. Each pair discusses the geography development of the Seven Wonders by comparing the ancient map with the modern map.

Task Chain 2: Study the history of the Seven Wonders

1. Each student receives an article on the history of the Seven Wonders (Focus Sheet 3-2).
2. Students draw timelines to correspond with reading.
3. Upon completion of the timeline, students are asked to log online to search for other events taking place in other countries.
4. The teacher picks a year and students will look to their timelines to discuss what happened that year.

Task Chain 3: Write a short essay explaining the relationships between geography and the historical development of the Ancient Wonders

Assessment:

Task Chain 1: Each student is expected to pin the Wonders' correct position on a map. They will also

discuss the geographical features introduced in the activity.

Task Chain 2: Students will draw timelines to correspond the reading. The teacher will circulate through the classroom to monitor students drawing the timeline.

Task Chain 3:

Writing (100 points)

Write a short, one-page essay, double spaced, to explain relationships between geography and the historical development of the Ancient Wonders based on what you learned from today's class and other sources like the Internet. It should contain an introduction, body, and conclusion. You will be graded according to the organization and usage of supportive evidence/resources.

90-100	Well organized with sufficient resources to support your ideas.
80-89	Well organized but not showing all components of required structure or enough evidence
70-79	Has a conclusion and some supportive evidence
60-69	No conclusion or the evidence is irrelevant
Below 60	Writing is poor and resources are lacking

Lesson Four:
Understanding Collapse

Objectives:

1. Introduce mnemonic skills
2. Practice mnemonic skills
3. Participate in a crossword game

Materials:

Focus Sheet 4-1
Work Sheet 4-2
Focus Sheet 4-3
Work Sheet 4-4
Focus Sheet 4-5

Task Chain 1: Introduce mnemonic skills

1. The teacher brainstorms with students about the mnemonic skills.
2. Students read the article "Mnemonic Techniques and Specific Memory Tricks to Improve Memory, Memorization" (Focus Sheet 4-1).
3. Students work on the comparison chart (Work Sheet 4-2).

Task Chain 2: Practice the selective mnemonic skill

1. The teacher explains the task of practicing the mnemonic skills after a reading activity.
2. Students read the article "Understanding Collapse" (Focus sheet 4-3).
   While reading, the teacher reminds students to apply mnemonic strategies to memorize the content.
3. Upon completing the reading, students are invited to report their own strategies and comment on the benefits or drawbacks.

Task Chain 3: Participate in a crossword game

1. The teacher introduces the crossword game.
2. Each group receives a crossword puzzle (Work Sheet 4-2). A competitive and incorporative environment is expected.
3. Upon finishing, the teacher shows the answer sheet (Background Sheet 4-4).

Assessment:

Task Chain 1: Each student will fill out the columns to compare mnemonic skills

Task Chain 2: Students are able to use and compare mnemonic skills to enhance memorization
Task Chain 3: Each group will report their progress and share their solutions with the class.

Lesson Five:
The 8th Wonder

Objects:

1. Study other Wonders
2. Analyze the writer's criteria for choosing the Seven Wonders
3. Develop own criteria to choose the 8th Ancient Wonder

Materials:

Focus Sheet 5-1
Focus Sheet 5-2

Task Chain 1: Study other wonders

1. The teacher brainstorms about the other wonders of the world.
2. The teacher shows pictures of some other wonders.
3. A list (Focus Sheet 5-1) is handed out to students.
4. Students work in pairs. They first pick 1 wonder from the list and then "surf" on Internet searching the relative information of the wonders.
5. Each pair briefly introduces the chosen wonder to the class.

Task Chain 2: Analyze the writer's criteria

1. Class discusses what makes a "Wonder" a Wonder. The teacher has students consider the location, structure, beauty, magnitude, and duration of each wonder as the criteria for its having been chosen as an extraordinary work. Students are called on to express ideas.
2. Groups read the article "History of the list if Ancient Winders" (Focus Sheet 5-2).
3. Students summarize Philo's criteria that justified the Seven Ancient Wonders, using an organizer.

Task Chain 3: Develop one's own criteria in order to choose the 8th wonder.

1. Each group designs their own criteria for the 8th Wonder.
2. Each group reports their criteria to the class.

Lesson Six:
Why Do We Study Other Cultures?

Objects:

1. Review and evaluate the unit study
2. Discuss Kitaro's music "Ancient"
3. Write an essay to reflect the culture study.

Materials:

Kitaro' album of "Ancient"

Task Chain 1: Review and evaluate the unit of study.
Students work on an outline focusing on questions such as:
What I have learned/realized/understood
What I am still confused about
What I would like to study

Task Chain 2: Listen to Kitaro's music "Ancient"

1. The teacher introduces Kitaro, a rewarded music composer. The introduction emphasizes on his music style and his understanding of cultures.
2. The teacher plays Kitaro's music "Ancient" which was scored for documentary "the Ancient Civilization" made by NHK.
3. Students close eyes to imagine the journey of an exploration that started 2200 years ago from China to the west.
4. Class discusses the music.

Task Chain 3: Write an essay to reflect the study of cultures

1. Students read "Why Do We Study Cultures?" (Focus Sheet 6-1).
2. Students write an essay on why we study other cultures.

Assessment:

Task Chain 1: Every student will write an outline and answer the listed questions.

Task Chain 2: Make sure students' eyes are closed while listening.

Task Chain 3: Writing (50 points)
Taking the unit study and your experience into account, write one page, double spaced, to illustrate your opinion of why we study other cultures. It should contain a thesis, body, and conclusion. You will be graded according to the following rubric:

Category and Points	Score
Idea Content 10 Points Thesis is clear, original and focused. 8 Points This is clear but information is general 6 Points More information is needed 4 Points No central theme.	
Organization 10 Points Sequence is logical and transitions are smooth 8 Points Body paragraphs do not tie to thesis 6 Points Conclusion is present but not clear 4 Points No lead or no conclusion	
Credibility 10 Points Adequate information to support main idea 8 Points Most of evidence is relevant 6 Points Need more information to support thesis 4 Points Thesis cannot stand alone due to lack of information	
Word Choice 10 Points Verbs are strong; description words are specific and accurate 8 Points Verb usage and descriptive words are used well but not accurate 6 Points Language is functional. Writer uses familiar words and few energetic verbs. 4 Points Too much repetition of familiar words lacking clarity.	
Conventions 10 Points Grammar and usage are correct and contribute to clarity. 8 Points Grammar and usage are correct. Spelling and punctuation may have minor errors. 6 Points Some usage and grammar problems exist. 4 Points Error in grammar and usage effect meaning.	

Total_____

Focus Sheet 1-1

Introduction to the Seven Ancient Wonders

Everyone has heard of each of the Seven Wonders of the Ancient World, but few have seen all of them for themselves. To do so one has to go abroad to Persia, cross the Euphrates River, travel to Egypt, spend some time among the Elians in Greece, go to Halicarnassus in Caria, sail to Rhodes, and see Ephesus in Ionia. Only if you travel the world and get worn out by the effort of the journey will the desire to see all the Wonders of the World be satisfied, and by the time you have done that you may be old and practically dead.

Because of this, education can perform a remarkable and valuable task: it removes the necessity to travel, and displays the beautiful and amazing things to one's eyes. If a man goes to the different locations, sees them once and goes away, he immediately forgets: the details of the works are not recalled, and memories of the individual features fail. But if a man investigates in verbal form the things to wonder at and the execution of their construction, and if he contemplates, as though looking at a mirror image, the whole skillful work, he keeps the impressions of each picture indelible in his mind. The reason for this is that he has seen amazing things.

What I say will be shown to be reliable if my words make a clear description of each of the Seven Wonders, and persuade the listener to acknowledge that he has got an idea of the spectacle. Of course, only the Seven Wonders are commonly described as praiseworthy, in so far as other sights can be seen just as much as these, but the admiration provoked for the Seven Wonders and for other sights is different. For beauty, like the sun, makes it impossible to see other things when it is itself radiant.

Except from Romer, J. & Romer, E. (1995). The Seven Wonders of the World: A History of the Modern Imagination. New York: Henry Holt and Company.

Focus Sheet 1-2

Overview of the Seven Wonders

1. It is the one and only wonder which does not require a description by early historians and poets. It is the one and only Wonder that does not need speculations concerning its appearance, size, and shape. It is the oldest, yet it is the only survivor among of the Seven Ancient Wonders. It is the Great Pyramid of Giza.

2. This is the statue of the god in whose honor the ancient Olympic games were held. It was located on the land that gave its very name to the Olympics. At the time of the games, wars stopped, and athletes came from Asia Minor, Syria, Egypt, and Sicily to celebrate the Olympics and to worship their king of gods: Zeus.

3. Is it simply a temple? How could it take its place among other unique structures such as the Pyramid, the Hanging Gardens, and the Colossus of Rhodes? For the people who actually visited it, the answer was simple. It was not just a temple... It was the most beautiful structure on earth... It was built in honor of the Greek goddess of hunting, wild nature, and fertility. That was the Temple of Artemis at Ephesus.

4. Similar to the Great Pyramid, we are now visiting the burial place of an ancient king. Yet the Mausoleum is different--so different from the Pyramid that it earned its reputation--and a spot within the list--for other reasons. Geographically, it is closer to the Temple of Artemis... And it was the beauty of the tomb rather than its size that fascinated its visitors for years.

5. From its building to its destruction lies a time span of merely 56 years. Yet the colossus earned a place in the famous list of Wonders. "But even lying on the ground, it is a marvel," said Pliny the Elder. The Colossus of Rhodes was not only a gigantic statue. It was rather a symbol of unity of the people who inhabited that beautiful Mediterranean island--Rhodes.

6. Of the Seven Wonders of the Ancient World, only one had a practical use in addition to its architectural elegance: The Lighthouse of Alexandria. For sailors, it ensured a safe return to the great harbor. For architects, it meant even more: it was the tallest

building on Earth. In addition, for scientists, it was the mysterious mirror that fascinated those most... The mirror which reflection could be seen more than 50 km (35 miles) offshore.

7. Fruits and flowers... Waterfalls... Gardens hanging from the palace terraces... Exotic animals... This is the picture of the Hanging Gardens of Babylon in most people's minds. It may be surprising to know that they might have never existed except in the minds of Greek poets and historians!

(Source:http://ce.eng.usf.edu/pharos/wonders/index.html)

Focus Sheet 2-1

Ancient Egyptians' Math (I)

Ancient Egyptians used doubling to do division. For example to divide 1495 by 65, we proceed as follows:

1	65
2	130
4	260
8	520
16	1040

We stop at this point because the next doubling will take us beyond 1495. Now we look for numbers in the right hand column that add up to 1495. We see that 1040 + 260 + 130 + 65 = 1495 and we tick the rows in which these numbers occur:

1	65 ✓
2	130 ✓
4	260 ✓
8	520
16	1040 ✓

Now add the numbers in the left hand column that are in ticked rows:

16 + 4 + 2 + 1 = 23,

Therefore, 1495 divided by 65 is 23.

Focus Sheet 2-2

Ancient Egyptians' Math (II)

What happens if the numbers do not divide exactly? Then the Egyptian method will yield fractions as the following example shows.

To divide 1500 by 65 proceed as before:

1	65
2	130
4	260
8	520
16	1040

Again, we stop since the next doubling takes us beyond 1500. Now look for the numbers in the right hand column that add to a number n with $1500-65 < n \leq 1500$ (The Egyptians knew that this was always possible: can you prove that this is so). In this case, we have

$1040 + 260 + 130 + 65 = 1495$

And we are 5 short of our sum. Again, tick the rows with these entries:

1	65	✓
2	130	✓
4	260	✓
8	520	
16	1040	✓

Now add the numbers in the left hand column which are in ticked rows:

$16 + 4 + 2 + 1 = 23,$

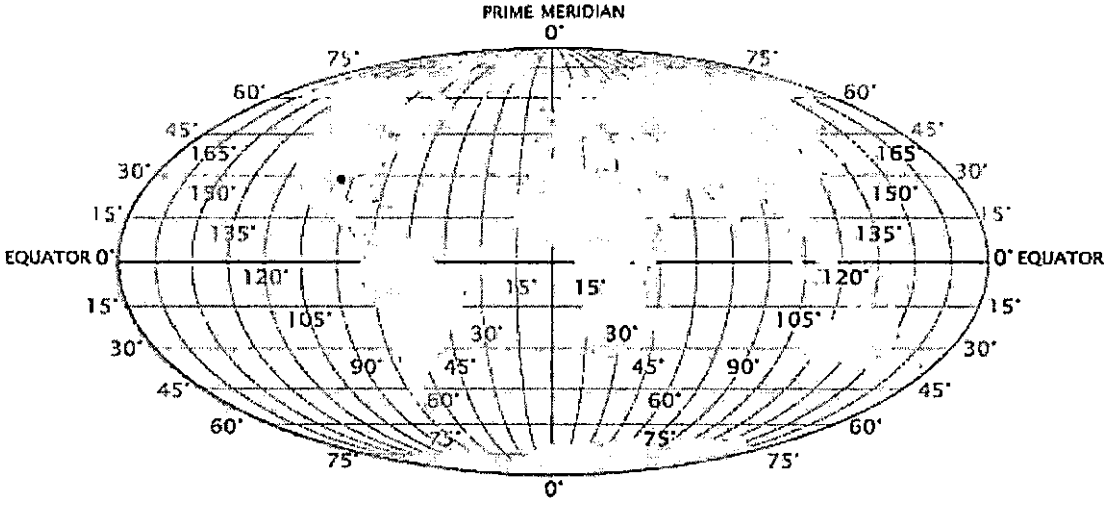
Therefore, 1500 divided by 65 is 23 and $^{5}/_{65} = {}^{1}/_{13}$ remaining. Hence, the answer is $23\ {}^{1}/_{13}$.

We have cheated a little here for the fraction obtained is a unit fraction, which is a number of the form 1/n for n an integer. In fact, the Egyptians only had fractions of this type and if the answer had not involved a unit fraction then the Egyptians would have written the fractional part as the sum of unit fractions.

(Source:
http://www-groups.dcs.st-and.ac.uk/~history/HistTopics/Egyptian_papyri.html)

Focus Sheet 2-3

Map



LATITUDE & LONGITUDE

Latitude (shown as a horizontal line) is the angular distance, in degrees, minutes, and seconds of a point north or south of the Equator. Lines of latitude are often referred to as parallels.

Longitude (shown as a vertical line) is the angular distance, in degrees, minutes, and seconds, of a point east or west of the Prime (Greenwich) Meridian. Lines of longitude are often referred to as meridians.

RELATIVE & ABSOLUTE LOCATIONS

Relative Location of a city or destination on the planet is its relationship to nearby landmarks. As an example, our office is on Galveston Island, located in southeastern Texas in the Gulf of Mexico, about 48 miles southeast of Houston. That is our relative location.

Absolute Location is the definitive location of a place using a recognized coordinate system. In terms of latitude and longitude, our office in Galveston, Texas, is 29'3' North, 94'8' West, marked with the red dot on the map above

(Source: http://wonderclub.com/Atlas/imageg.htm)

Focus Sheet 3-1

History of the Hanging Gardens

The Babylonian kingdom flourished under the rule of the famous king, Hammurabi (1792-1750 BC). It was not until the reign of Naboplashar (625-605 BC) of the Neo-Babylonian dynasty that the Mesopotamian civilization reached its ultimate glory. His son, Nebuchadnezzar II (604-562 BC) is credited for building the legendary Hanging Gardens. It is said that the Gardens were built by Nebuchadnezzar to please his wife or concubine who had been "brought up in Media and had a passion for mountain surroundings."

While the most descriptive accounts of the Gardens come from Greek historians such as Berossus and Diodorus Siculus, Babylonian records stay silent on the matter. Tablets from the time of Nebuchadnezzar do not have a single reference to the Hanging Gardens, although descriptions of his palace, the city of Babylon, and the walls are found. Even the historians who give detailed descriptions of the Hanging Gardens never saw them. Modern historians argue that when Alexander's soldiers reached the fertile land of Mesopotamia and saw Babylon, they were impressed. When they later returned to their rugged homeland, they had stories to tell about the amazing gardens and palm trees at Mesopotamia, about the palace of Nebuchadnezzar, about the Tower of Babel and the ziggurats. It was the imagination of poets and ancient historians that blended all these elements together to produce one of the World Wonders.

It was not until the twentieth century that some of the mysteries surrounding the Hanging Gardens were revealed. Archaeologists are still struggling to gather enough evidence before reaching the conclusions about the location of the Gardens, their irrigation system, and their true appearance. Some recent researchers even suggest that the Hanging Gardens were built by Senaherib, not by Nebuchadnezzar II (ca. 100 years earlier).

(Source:http://ce.eng.usf.edu/pharos/wonders/index.html)

Focus Sheet 3-1(Continued)

History of Statue of Zeus

Pheidias began working on the statue of Zeus around 440 BC. Years earlier, he had developed a technique to build enormous gold and ivory statues. This was done by erecting a wooden frame on which sheets of metal and ivory were placed to provide the outer covering. Pheidias' workshop in Olympia still exists, and is coincidentally -- or may be not -- identical in size and orientation to the temple of Zeus. There, he sculpted and carved the different pieces of the statue before they were assembled in the temple.

When the statue was completed, it barely fit in the temple. Strabo wrote:

> "... although the temple itself is very large, the sculptor is criticized for not having appreciated the correct proportions. He has shown Zeus seated, but with the head almost touching the ceiling, so that we have the impression that if Zeus moved to stand up he would unroof the temple."

Strabo was right, except that the sculptor is to be commended, not criticized. It is this size impression that made the statue so wonderful. It is the idea that the king of gods is capable of unroofing the temple if he stood up that fascinated poets and historians alike. The base of the statue was about 6.5 m (20 ft) wide and 1.0 meter (3 ft) high. The height of the statue itself was 13 m (40 ft), equivalent to a modern 4-story building.

The statue was so high that visitors described the throne more than Zeus body and features. The legs of the throne were decorated with sphinxes and winged figures of Victory. Greek gods and mythical figures also adorned the scene: Apollo, Artemis, and Niobe's children. The Greek Pausanias wrote:

On his head is a sculpted wreath of olive sprays. In his right hand he holds a figure of Victory made from ivory and gold... In his left hand, he holds a sceptre inlaid with every kind of metal, with an eagle perched on the sceptre. His sandals are made of gold, as is his robe. His garments are carved with animals and with lilies. The

throne is decorated with gold, precious stones, ebony, and ivory.

The statue was occasionally decorated with gifts from kings and rulers. The most notable of these gifts was a woolen curtain "adorned with Assyrian woven patterns and Pheonician dye" which was dedicated by the Syrian king Antiochus IV.

Copies of the statue were made, including a large prototype at Cyrene (Libya). None of them, however, survived to the present day. Early reconstructions such as the one by von Erlach are now believed to be rather inaccurate. For us, we can only wonder about the true appearance of the statue--the greatest work in Greek sculpture.

(Source:http://ce.eng.usf.edu/pharos/wonders/index.html)

Focus Sheet 3-1(Continued)

History of the Colossus of Rhodes

Throughout most of its history, ancient Greece was comprised of city-states which had limited power beyond their boundary. On the small island of Rhodes were three of these: Ialysos, Kamiros, and Lindos. In 408 BC, the cities united to form one territory, with a unified capital, Rhodes. The city thrived commercially and had strong economic ties with their main ally, Ptolemy I Soter of Egypt. In 305 BC, the Antigonids of Macedonia, who were also rivals of the Ptolemies, besieged Rhodes in an attempt to break the Rhodo-Egyptian alliance. They could never penetrate the city. When a peace agreement was reached in 304 BC, the Antagonids lifted the siege, leaving a wealth of military equipment behind. To celebrate their unity, the Rhodians sold the equipment and used the money to erect an enormous statue of their sun god, Helios.

The construction of the Colossus took 12 years and was finished in 282 BC. For years, the statue stood at the harbor entrance, until a strong earthquake hit Rhodes about 226 BC. The city was badly damaged, and the Colossus was broken at its weakest point--the knee. The Rhodians received an immediate offer from Ptolemy III Eurgetes of Egypt to cover all restoration costs for the toppled monument. However, an oracle was consulted and forbade the re-erection. Ptolemy's offer was declined.

For almost a millennium, the statue lay broken in ruins. In AD 654, the Arabs invaded Rhodes. They disassembled the remains of the broken Colossus and sold them to a Jew from Syria. It is said that the fragments had to be transported to Syria on the backs of 900 camels.

Let us first clear a misconception about the appearance of the Colossus. It has long been believed that the Colossus stood in front of the Mandraki harbor, one of many in the city of Rhodes, straddling its entrance. Given the height of the statue and the width of the harbor mouth, this picture is more impossible than improbable. Moreover, the fallen Colossus would have blocked the harbor entrance. Recent studies suggest that it was erected either on the eastern promontory of the Mandraki

harbor, or even further inland. Anyway, it did never straddle the harbor entrance.

The project was commissioned by the Rhodian sculptor Chares of Lindos. To build the statue, his workers cast the outer bronze skin parts. The base was made of white marble, and the feet and ankle of the statue were first fixed. The structure was gradually erected as the bronze form was fortified with an iron and stone framework. To reach the higher parts, an earth ramp was built around the statue and was later removed. When the colossus was finished, it stood about 33 m (110 ft) high. Moreover, when it fell, "few people can make their arms meet round the thumb," wrote Pliny.

Although we do not know the true shape and appearance of the Colossus, modern reconstructions with the statue standing upright are more accurate than older drawings. Although it disappeared from existence, the ancient World Wonder inspired modern artists such as French sculptor Auguste Bartholdi best known by his famous work: The Statue of Liberty.

(Source:http://ce.eng.usf.edu/pharos/wonders/index.html)

Focus Sheet 3-1(Continued)

History of Great Pyramid

Contrary to the common belief, only the Great Pyramid of Khufu (Cheops), not all three Great Pyramids, is on top of the list of Wonders. The monument was built by the Egyptian pharaoh Khufu of the Fourth Dynasty around the year 2560 BC to serve as a tomb when he died. The tradition of pyramid building started in Ancient Egypt as a sophistication of the idea of a *mastaba* or "platform" covering the royal tomb. Later, several stacked *mastabas* were used. Early pyramids, such as the Step Pyramid of King Zoser (Djoser) at Saqqara by the famous Egyptian architect, Imhotep, illustrate this connection.

The great pyramid is believed to have been built over a 20 year period. The site was first prepared, and blocks of stone were transported and placed. An outer casing (which disappeared over the years) was then used to smooth the surface. Although it is not known how the blocks were put in place, several theories have been proposed. One theory involves the construction of a straight or spiral ramp that was raised as the construction proceeded. This ramp, coated with mud and water, eased the displacement of the blocks which were pushed (or pulled) into place. A second theory suggests that the blocks were placed using long levers with a short angled foot.

Throughout their history, the pyramids of Giza have stimulated human imagination. They were referred to as "The Granaries of Joseph" and "The Mountains of Pharaoh." When Napoleon invaded Egypt in 1798, his pride was expressed through his famous quote: "Soldats! Du haut de ces Pyramides, 40 si'les nous contemplent." *(Soldiers! From the top of these Pyramids, 40 centuries are looking at us)*

Today, the Great Pyramid is enclosed, together with the other pyramids and the Sphinx, in the touristic region of the Giza Plateau. Also in the area is the museum housing the mysterious Sun Boat, only discovered in 1954 near the south side of the pyramid. The boat is believed to have been used to carry the body of Khufu in his last journey on earth before being buried inside the pyramid. It may also have served him as a means of transportation in his afterlife journey, according to ancient Egyptian beliefs.

When it was built, the Great Pyramid was 145.75 m. (481 ft) high. Over the years, it lost 10 m. (30 ft.) off its top. It ranked as the tallest structures on Earth for more than 43 centuries, only to be surpassed in height in the nineteenth century AD. It was covered with a casing of stones to smooth its surface (some of the casing can still be seen near the top of Khefre's pyramid). The sloping angle of its sides is 51 degrees and 51 minutes. Each side is carefully oriented with one of the cardinal points of the compass, that is, north, south, east, and west. The horizontal cross section of the pyramid is square at any level, with each side measuring 229 m. (751 ft.) in length. The maximum error between side lengths is astonishingly less than 0.1%.

The structure consists of approximately 2 million blocks of stone, each weighing more than two tons. It has been suggested that there are enough blocks in the three pyramids to build a 3 m. (10 ft.) high, 0.3 m. (1 ft.) thick wall around France. The area covered by the Great pyramid can accommodate St. Peter's in Rome, the cathedrals of Florence and Milan, and Westminster and St Paul's in London combined.

On the north face is the pyramid's entrance. A number of corridors, galleries, and escape shafts either lead to the King's burial chamber, or were intended to serve other functions. The King's chamber is located at the heart of the pyramid, only accessible through the Great Gallery and an ascending corridor. The King's sarcophagus is made of red granite, as are the interior walls of the King's Chamber. Most impressive is the sharp-edged stone over the doorway which is over 3 m (10 ft) long, 2.4 m (8 feet) high and 1.3 m (4 ft) thick. All of the interior stones fit so well, a card won't fit between them. The sarcophagus is oriented in accordance with the compass directions, and is only about 1 cm smaller in dimensions than the chamber entrance. It might have been introduced as the structure was progressing.

New theories concerning the origin and purpose of the Pyramids of Giza have been proposed... Astronomic observatories... Places of cult worship... Geometric structures constructed by a long-gone civilization... Even extraterrestrial-related theories have been proposed with little evidence in support... The overwhelming scientific and historic evidence still supports the conclusion that,

like many smaller pyramids in the region, the Great Pyramids were built by the great ancient Egyptian civilization off the west bank of the Nile as tombs for their magnificent Kings... Tombs where Khufu, Khefre, and Menkaure could start their mystic journey to the afterlife.

(Source:http://ce.eng.usf.edu/pharos/wonders/index.html)

Focus Sheet 3-1 (Continued)

History of the Temple of Artemis at Ephesus

Although the foundation of the temple dates back to the seventh century BC, the structure that earned a spot in the list of Wonders was built around 550 BC. Referred to as the great marble temple, or temple D, it was sponsored by the Lydian king Croesus and was designed by the Greek architect Chersiphron. The Temple was decorated with bronze statues sculpted by the most skilled artists of their time: Pheidias, Polycleitus, Kresilas, and Phradmon.

The temple served as both a marketplace and a religious institution. For years, the sanctuary was visited by merchants, tourists, artisans, and kings who paid homage to the goddess by sharing their profits with her. Recent archeological excavations at the site revealed gifts from pilgrims including statuettes of Artemis made of gold and ivory... earrings, bracelets, and necklaces... artifacts from as far as Persia and India.

On the night of 21 July 356 BC, a man named Herostratus burned the temple to ground in an attempt to immortalize his name, which he did indeed. Oddly enough, Alexander the Great was born the same night. The historian Plutarch later wrote that the goddess was "too busy taking care of the birth of Alexander to send help to her threatened temple." And when Alexander the Great conquered Asia Minor, he offered to rebuild the destroyed temple, but the Temple was not restored until after his death in 323 BC. The temple was eventually restored and is labeled "Temple E" by archeologists.

When St Paul visited Ephesus to preach Christianity in the first century AD, he was confronted by the Artemis' cult who had no plans to abandon their goddess. And when the temple was again destroyed by the Goths in AD 262, the Ephesians vowed to rebuild. By the fourth century AD, most Ephesians had converted to Christianity and the temple lost its religious glamor. The final chapter came when in AD 401 the Temple of Artemis was torn down by St John Chrysostom. Ephesus was later deserted, and only in the late nineteenth century has the site been excavated. The digging revealed the temple's foundation and the road to the now swampy site. Attempts were recently made to

rebuilt the temple, but only a few columns have been re-erected.

The foundation of the temple was rectangular in form, similar to most temples at the time. Unlike other sanctuaries, however, the building was made of marble, with a decorated facade overlooking a spacious courtyard. Marble steps surrounding the building platform led to the high terrace which was approximately 80 m. (260 ft.) by 130 m. (430 ft.) in plan. The columns were 20 m. (60 ft.) high with Ionic capitals and carved circular sides. There were 127 columns in total, aligned orthogonally over the whole platform area, except for the central cella or house of the goddess.

The temple housed many works of art, including four ancient bronze statues of Amazons sculpted by the finest artists at the time. When St. Paul visited the city, the temple was adorned with golden pillars and silver statuettes, and was decorated with paintings. There is no evidence that a statue of the goddess herself was placed at the center of the sanctuary, but there is no reason not to believe so.

The early detailed descriptions of the temple helped archeologists reconstruct the building. Many reconstructions such as that by H.F. von Erlach depicted the facade with a four-column porch which never existed. More accurate reconstructions may give us an idea about the general layout of the temple. However, its true beauty lies in the architectural and artistic details which will forever remain unknown.

(Source:http://ce.eng.usf.edu/pharos/wonders/index.html)

Focus Sheet 3-1 (Continued)

History of the Lighthouse of Alexandria

Shortly after the death of Alexander the Great, his commander Ptolemy Soter assumed power in Egypt. He had witnessed the founding of Alexandria, and established his capital there. Off of the city's coast lies a small island: Pharos. Its name, legend says, is a variation of *Pharaoh's Island*, but it is more likely that the name is Greek in origin. The island was connected to the mainland by means of a dike--the Heptastadion--which gave the city a double harbor. And because of dangerous sailing conditions and flat coastline in the region, the construction of a lighthouse was necessary.

The project was conceived and initiated by Ptolemy Soter around 290 BC, but was completed after his death, during the reign of his son Ptolemy Philadelphus. Sostratus, a contemporary of Euclid, was the architect, but detailed calculations for the structure and its accessories were carried out at the Alexandria Library/Mouseion. The monument was dedicated to the *Savior Gods*: Ptolemy Soter (*lit.* savior) and his wife Berenice. For centuries, the Lighthouse of Alexandria (occasionally referred to as the Pharos Lighthouse) was used to mark the harbor, using fire at night and reflecting sun rays during the day. It was even shown on Roman coins, just as famous monuments are depicted on currency today.

When the Arabs conquered Egypt, they admired Alexandria and its wealth. The Lighthouse continues to be mentioned in their writings and travelers accounts. But the new rulers moved their capital to Cairo since they had no ties to the Mediterranean. When the mirror was brought down mistakenly, they did not restore it back into place. In AD 956, an earthquake shook Alexandria, and caused little damage to the Lighthouse. It was later in 1303 and in 1323 that two stronger earthquakes left a significant impression on the structure. When the famous Arab traveler Ibn Battuta visited Alexandria in 1349, he could not enter the ruinous monument or even climb to its doorway.

The final chapter in the history of the Lighthouse came in AD 1480 when the Egyptian Mamelouk Sultan, Qaitbay, decided to fortify Alexandria's defense. He built

a medieval fort on the same spot where the Lighthouse once stood, using the fallen stone and marble.

Of the six vanished Wonders, the Lighthouse of Alexandria was the last to disappear. Therefore we have adequately accurate knowledge of its location and appearance. Ancient accounts such as those by Strabo and Pliny the Elder give us a brief description of the "tower" and the magnificent white marble cover. They tell us how the mysterious mirror could reflect the light tens of kilometers away. Legend says the mirror was also used to detect and burn enemy ships before they could reach the shore.

In 1166, an Arab traveler, Abou-Haggag Al-Andaloussi visited the Lighthouse. He documented a wealth of information and gave an accurate description of the structure which helped modern archeologists reconstruct the monument. It was composed of three stages: The lowest square, 55.9 m. (183.4 ft.) high with a cylindrical core; the middle octagonal with a side length of 18.30 m. (60.0 ft.) and a height of 27.45 m. (90.1 ft.); and the third circular 7.30 m. (24.0 ft.) high. The total height of the building including the foundation base was about 117 m. (384 ft.), equivalent to a 40-story modern building. The internal core was used as a shaft to lift the fuel needed for the fire. At the top stage, the mirror reflected sunlight during the day while fire was used during the night. In ancient times, a statue of Poseidon adorned the summit of the building.

Although the Lighthouse of Alexandria did not survive to the present day, it left its influence in various respects. From an architectural standpoint, the monument has been used as a model for many prototypes along the Mediterranean, as far away as Spain. And from a linguistic standpoint, it gave its name--Pharos--to all the lighthouses in the world... Just look up the dictionary for the French, Italian, or Spanish word for *lighthouse*.

(Source:http://ce.eng.usf.edu/pharos/wonders/index.html)

Focus Sheet 4-1

Mnemonic Techniques and Specific Memory Tricks to Improve Memory, Memorization

Mnemonic techniques are specific memory aids. Many are based on the general memory strategies that were presented earlier. Although it can be easiest to remember those things that you understand well, sometimes you must rely on rote memory. The following techniques can be used to facilitate such memorization.

1. ACRONYMS.
   You form acronyms by using each first letter from a group of words to form a new word. This is particularly useful when remembering words in a specified order. Acronyms are very common in ordinary language and in many fields. Some examples of common acronyms include NBA (National Basketball Associations), SCUBA (Self Contained Underwater Breathing Apparatus), BTUs (British Thermal Units), and LASER (Light Amplification by Stimulated Emission of Radiation). What other common acronyms can you think of? The memory techniques in this section, for example, can be rearranged to form the acronym "SCRAM" (Sentences/acrostics, Chunking, Rhymes & songs, Acronyms, and Method of loci).

   Let us suppose that you have to memorize the names of four kinds of fossils for your geology class: 1) actual remains, 2) petrified, 3) imprint, and 4) molds or casts. Take the first letter of each item you are trying to remember: APIM. Then, arrange the letters so that the acronym resembles a word you are familiar with: PAIM or IMAP.

   Although acronyms can be very useful memory aids, they do have some disadvantages. First, they are useful for rote memory, but do not aid comprehension. Be sure to differentiate between comprehension and memory, keeping in mind that understanding is often the best way to remember. Some people assume that if they can remember something, that they must "know" it; but memorization does not necessarily imply understanding. A second problem with acronyms is that they can be difficult to form; not all lists of words will lend themselves equally well to this technique. Finally, acronyms, like everything else, can be forgotten if not committed to memory.

2. METHOD OF LOCI.
   This technique was used by ancient orators to remember speeches, and it combines the use of organization, visual memory, and association. Before using the technique, you must identify a common path that you walk. This can be the walk from your dorm to class, a walk around your house, whatever is familiar. What is essential is that you have a vivid visual memory of the path and objects along it. Once you have determined your path, imagine yourself walking along it, and identify specific landmarks that you will pass. For example, the first landmark on your walk to campus could be your dorm room, next may be the front of the residence hall, next a familiar statue you pass, etc. The number of landmarks you choose will depend on the number of things you want to remember.

   Once you have determined your path and visualized the landmarks, you are ready to use the path to remember your material. This is done by mentally associating each piece of information that you need to remember with one of these landmarks. For example, if you are trying to remember a list of mnemonics, you might remember the first--acronyms--by picturing SCUBA gear in your dorm room (SCUBA is an acronym).

   You do not have to limit this to a path. You can use the same type of technique with just about any visual image that you can divide into specific sections. The most important thing is that you use something with which you are very familiar.

(Source:
http://brain.web-us.com/memory/mnemonic_techniques.htm)

Work Sheet 4-2

After reading the article, fill out the following chart.

Mnemonic skills	Definition	When to Use	How to use	Prior experience of using this skill

Focus Sheet 4-3

Understanding Collapse

The normal pattern of history shows one civilization succeeding another, either rapidly or gradually. When a large state-level society falls, the population size and density decrease dramatically. Society tends to become less politically centralized. Less investment is made in elements such as architecture, art, and literature. Trade and other economic activities are greatly diminished, and the flow of information among people slows. The ruling elites may change, but usually the working classes tend to remain and provide continuity (though in some cases, virtually no one remains).

Is it possible to prevent a collapse?

Scientists Thuman and Bennet have highlighted "prerequisites for survival," needs that must be met in order for a society to continue:

- Every society must be able to answer the basic biological needs of its members: food, drink, shelter, and medical care.
- Every society must provide for the production and distribution of goods and services (perhaps through a division of labor, rules concerning property and trade, or ideas about the role of work).
- Every society must provide for the reproduction of new members and consider laws and issues related to reproduction (regulation, marriageable age, number of children, and so on).
- Every society must provide for the training (education, apprenticeship, passing on of values) of an individual so that he or she can become a functioning adult in the society.
- Every society must provide for the maintenance of internal and external order (laws, courts, police, wars, diplomacy).
- Every society must provide meaning and motivation to its members.

This last prerequisite is more important than it may seem. No societal activity is possible unless people are motivated to participate. Why do we get up in the morning? How do we see ourselves in relation to other members of society? Why do we follow a society's rules? Without a sense of meaning and motivation, people will become apathetic. If this happens, a society may be threatened with decline.

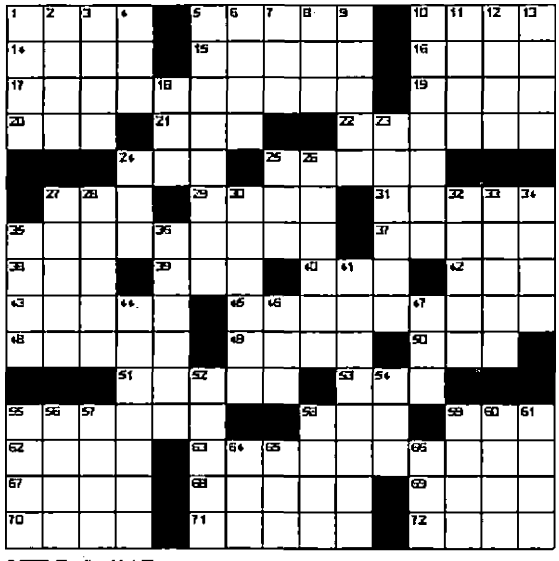
(Source: http://eawc.evansville.edu/sypage.htm)

Work Sheet 4-4

SEVEN WONDERS OF THE ANCIENT WORLD

Puzzle by Frank A. Longo
Edited by Will Shortz

The New York Times Learning Network
www.nytimes.com/learning



ACROSS

1. Egyptian city that was a burial ground of ancient Memphis and is home to the Great Pyramid of Khufu
5. Where ___ (the place to be): 2 wds.
10. Reed instrument
14. "Woe is me!"
15. V-shaped cut
16. Impose, as a tax
17. Structure built by Ptolemy I on the ancient island of Pharos
19. Decade division
20. French for "the"
21. Helios (see 55-Down) was the Greek God of this
22. Structure built in honor of the Greek goddess Artemis in the ancient city of Ephesus
24. Bill Clinton's party: Abbr.
25. Vise
27. April follower
29. Assistant
31. "Total due" statements
35. Body of water in which 55-Across is located: 2 wds.
37. "Eating ___" (black comedy of 1982)
38. Monk's title
39. Prefix with natal or liberal
40. Fellow
42. Sheep's cry
43. Correct the position of
45. Elaborate tomb built in the ancient city of Halicarnassus for the king of Caria
48. Pertaining to the kidneys
49. Fencing sword
50. Driver's license, birth certificate, etc.
51. Like old styles that are once again popular
53. Road map abbr.
55. Greek island that was home to the Colossus, an enormous statue of Helios
58. Japanese sash worn over a kimono
59. Travel by plane
62. Time long past
63. Egyptian seaport that was home to the 17-Across of Pharos
67. Last word of a prayer
68. Loses one's temper
69. Humble
70. Loch ___ Monster
71. Construction material for the Great Pyramid of 1-Across
72. Phidias sculpted a giant ivory and gold statue of this Greek god at 10-Down

DOWN

1. ___ bladder (liver attachment)
2. "Would ___ to you?": 2 wds.
3. Moves after zigging
4. Bonfire residue
5. Brutally cruel
6. Animated character, for short
7. One of the Rugrats
8. Cooling systems, for short
9. Eighth Greek letter
10. Ancient Greek plain where athletic games were held in honor of 72-Across
11. Honk
12. Egg-shaped
13. "Jane ___" (Charlotte Brontë novel)
18. Mao ___-tung
23. It develops into a fetus
24. Coloring substance
25. Letters before F
26. The "L" of N.F.L.
27. Country singer Haggard
28. One more time
30. Compound that's atomically related to another compound
32. Like human ears
33. Hawaiian feasts
34. Shut forcefully
35. In the distance
36. American founder of the religious sect known as the Shakers: 2 wds.
41. Total number of clients that a software company has: 2 wds.
44. Hanging ___ of Babylon (creation of King Nebuchadnezzar, for his wife, on the east bank of the Euphrates)
46. Where to address letters to military personnel: Abbr.
47. Recline
52. Old Russian rulers
54. Metallic element with the symbol "Sn"
55. "I Know What You Did Last Summer" co-star Phillippe
56. Residence
57. Minerals that are mined and refined
58. Beasts of burden
59. At no charge
60. In ___ of (as a substitute for)
61. Shaggy 58-Down
64. Back muscle, for short
65. Self-love
66. Area in which it is forbidden to station army forces: Abbr.

Click FOR ANSWER GRID

(Source: Http://www.nytimes.com/learning)

Focus Sheet 4-5

Seven Wonders of the Ancient World

SEVEN WONDERS OF THE ANCIENT WORLD

Focus Sheet 5-1

The Other Wonders

Six out of seven Ancient Wonders did not survive to this present day. Human imagination urged poets, writers, and historians to seek "replacements" for the fallen monuments. Some proposed a new list for the Seven Wonders of the Modern World. Others have argued that ancient civilizations that the Greeks did not know of erected monuments that should have been included in the original list. Wonders such as the Great Wall of China, Taj Mahal in Agra, and the Temple of Angkor in Cambodia are a few examples.

Like the ancient list, the new ones include fascinating monuments and structures that changed the existing landscape. However, no single list won unanimous approval among historians, artists, and architects. Here is an alphabetical listing of some Forgotten, Modern, and Natural Wonders.

Forgotten Wonders

- Abu Simbel Temple in Egypt
- Angkor Wat in Cambodia
- The Aztec Temple in Tenochtitlan (Mexico City), Mexico
- The Banaue Rice Terraces in the Philippines
- Borobudur Temple in Indonesia
- The Colosseum in Rome, Italy
- The Great Wall of China
- The Inca city of Machu Picchu, Peru
- The Leaning Tower of Pisa, Italy
- The Mayan Temples of Tikal in Northern Guatemala
- The Moai Statues in Rapa Nui (Easter Island), Chile
- Mont-Saint-Michel in Normandy, France
- The Throne Hall of Persepolis in Iran
- The Parthenon in Athens, Greece
- Petra, the rock-carved city in Jordan
- The Shwedagon Pagoda in Myanmar
- Stonehenge in England
- Taj Mahal in Agra, India
- The Temple of the Inscriptions in Palenque, Mexico

Modern Wonders

- The Channel Tunnel
- The Clock Tower (Big Ben) in London, England
- The CN Tower in Toronto, Canada
- Eiffel Tower in Paris, France

- The Empire State Building in New York City, USA
- The Gateway Arch in St. Louis, USA
- The Golden Gate Bridge in San Francisco, USA
- The High Dam in Aswan, Egypt
- Hoover Dam in Arizona/Nevada, USA
- Itaip?Dam in Brazil/Paraguay
- Mount Rushmore National Memorial in South Dakota, USA
- The Panama Canal
- The Petronas Towers in Kuala Lumpur, Malaysia
- The Statue of Cristo Redentor in Rio de Janeiro, Brazil
- The Statue of Liberty in New York City, USA
- The Suez Canal in Egypt
- The Sydney Opera House in Australia

Natural Wonders

- Angel Falls in Venezuela
- The Bay of Fundy in Nova Scotia, Canada
- The Grand Canyon in Arizona, USA
- The Great Barrier Reef in Australia
- Igua Falls in Brazil/Argentina
- Krakatoa Island in Indonesia
- Mount Everest in Nepal
- Mount Fuji in Japan
- Mount Kilimanjaro in Tanzania
- Niagara Falls in Ontario (Canada) and New York State (USA)
- Paricutin volcano in Mexico
- Victoria Falls in Zambia/Zimbabwe

(Source: http://ce.eng.usf.edu/pharos/wonders/other.html)

Focus Sheet 5-2

History of the List of Ancient Wonders

Although most people know that a list exists of the Seven World Wonders, only few can name them. The list of the Seven Wonders of the Ancient World was originally compiled around the second century BC. The first reference to the idea is found in the History of Herodotus as long ago as the 5th century BC. Decades later, Greek historians wrote about the greatest monuments at the time. Callimachus of Cyrene (305 B.C.-240 B.C.), Chief Librarian of the Alexandria Mouseion, wrote "A Collection of Wonders around the World." All we know about the collection is its title, for it was destroyed with the Alexandria Library.

The final list of the Seven Wonders was compiled during the Middle Ages. The list comprised the seven most impressive monuments of the Ancient World, some of which barely survived to the Middle Ages. Others did not even co-exist. Among the oldest references to the canonical list are the engravings by the Dutch artist Maerten van Heemskerck (1498-1574), and Johann Fischer von Erlach's History of Architecture.

Today, archaeological evidence reveals some of the mysteries that surrounded the history of the Wonders for centuries. For their builders, the Seven Wonders were a celebration of religion, mythology, art, power, and science. For us, they reflect the ability of humans to change the surrounding landscape by building massive yet beautiful structures, one of which stood the test of time to this very day.

(Source:http://www.learner.org/exhibits/collapse/index.htm)

Focus Sheet 6-1

Why Do We Study Ancient Cultures?

What have we Learned about ancient cultures? You could probably tally up a list of facts--the names of the families represented in The Bhagavad Gita, e.g., Mohammed's birth and death dates, the relationship of crime and punishment in The Inferno--though such a list would tell you little about how real people lived and how these "facts" influenced their lives. You might want to recall key concepts from this brief essay--the association of Hinduism with the illusory nature of the material world, the Greek belief in rationality, the Roman ability to organize and delegate. But these generalizations do not allow for minority opinions within the cultures, nor, most likely, do the generalizations say much about the people who were not gifted writers, powerful politicians, influential artists, successful interpreters of their social circumstances. On just about any given day in the midst of choking sand and blazing heat, what might some of those Egyptian stone-haulers have said in passing about their omnipotent pharaoh?

Oddly enough, culture includes all these people. Mikhail Bakhtin looks at cultures as heterogeneous groups of people whose conversations--the record of their poetry, their discord, and their babble--becomes an on-going dialog in a constantly changing, adaptive language. To his way of thinking, there is little of fixed or permanent status to any culture. A culture is always so much more than any given language can express, certainly more than what any icon could represent.

Recent ethnographers have expressed a number of concerns about cultural investigation--that is, studying and interpreting other cultures. The ethnographers warn that there is no neutral, objective investigation of another culture. One problem is that we are so formed by our own culture that we tend automatically to judge what we see in another culture by what we "know" from our own--so much for disinterested investigation. Another problem arises from the fact that the categories of our understanding--our criteria for organization--are, themselves, culture-bound. Westerners think like Westerners because their experience is in and of the West. As colonial authorities in India, the British tried to outlaw status, the ritual immolation of a wife who

remained after the death of her husband. To the British the ritual was perverse, anti-woman; yet it was an accepted ritual, with a long history and a logic appertaining to a world-system different from that of the British (busy, it must be said, with colonizing and imposing their world-system on others). The British could not accept in others what their culture forbade for them.

But, happily, Americans can learn to listen to and love the music of the sitar (just as they may learn to listen to and love Mozart). And it doesn't take too long a trip through the concrete reality of strip shopping malls and pandering fast-food joints to convince many Americans that maybe we have erred on the side of the material.

At the same time, there is comfort in knowing that we were not the first culture to look upon the sobering wreckage of our wars or the changing forms of violence around us and wonder if there was not a better way to live --with greater tolerance for others, greater humility for ourselves, greater love for our shared world. This may be what studying ancient cultures teaches us.

(Source: http://eawc.evansville.edu/sypage.htm)

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