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Inferencing Reading Strategy Used To Improve Reading Comprehension Of Adult Esl Students

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**INFERCING READING STRATEGY USED TO IMPROVE READING
COMPREHENSION OF ADULT ESL STUDENTS**

by

NAWAL AZAR

DISSERTATION

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

2018

MAJOR: LEARNING DESIGN AND
TECHNOLGY

Approved By:

Advisor

Date

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DEDICATON

This research project
is dedicated in memory
of my parents
Ali and Khadija Abbas

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CHAPTER 1—INTRODUCTION

According to the Institute of International Education (2015) Open Doors Report, there are over one million international students enrolled in full time graduate and undergraduate programs in U.S. colleges and universities. In the 2014-2015 academic year there was close to 9% international student increase from the previous academic year (Institute of International Education, 2015). As shown in Table 1, there has been a gradual increase over the last 11 years in international student enrollment at American universities. The growth in international student enrollment is related to the strength of a U.S. college degree and potential for foreign students to find employment in the U.S.A. The tuition generated from international students motivates U.S. higher education administrators to aggressively market their institution. One of the most important marketing tools for international student recruitment in higher education is a dedicated educational program for teaching English as a Second Language (ESL).

Table 1. *New International Students in USA 2005-2015*

Student Type	05/06	06/07	07/08	08/09	2009/10	10/11	11/12	12/13	13/14	14/15
Undergraduate	61,342	63,749	68,195	82,136	79,365	84,543	90,903	102,069	109,486	112,765
Graduate	64,235	72,726	78,489	84,828	84,613	89,505	92,211	100,129	108,519	121,637
Non-Degree	17,346	20,703	26,437	33,496	38,992	40,442	45,353	48,722	52,123	59,364
Total	142,923	157,178	173,121	200,460	202,970	214,490	228,467	250,920	270,128	293,766

ESL programs prepare international students for earning a high score on the TOEFL exam, the international English language test. In preparing international students to earn a high score on the TOEFL exam, ESL programs typically focus on reading comprehension skills. Effective instruction of reading comprehension is related to the learning strategies used in the ESL program. In addition, the motivational strategies used in the ESL program to help international students remain motivated and persistent on English language acquisition. Whereas learning strategies are the thoughts and actions people engage in (consciously or not) to learn new information (Chamot,

Barnhardt, El-Dinary, & Robbins, 1999), motivation refers broadly to what people desire, what they choose to do, what they commit to do, and how actively or intensely they pursue their goals (Keller, 2010). Combining an effective learning strategy for reading comprehension with effective motivational strategies will help international students in ESL programs perform well on the TOEFL exam.

One goal of teaching learning strategies is to help students consciously control how they learn so they can be efficient, motivated, and independent language learners (Chamot, Barnhardt, El-Dinary, & Robbins, 1999). The intent of instructional content designed with learning strategies is for ESL students to be academically prepared for main stream classrooms. Studies have shown that when students begin to understand their own learning process and can exert some control over this process, they tend to take more responsibility for their own learning (Chamot, Keatley, Meloni, Gonglewski, & Bartoshesky, 2011). Moreover, successful learning appears to be related to regulation of one's own knowledge base (Dörnyei, & Skehan, 2003).

Learning strategies are also related to the learner's motivation to learn, and Keller (2010) describes motivational problems as key to developing the learner's higher sense of self-efficacy and confidence in their own learning ability. For ESL students, motivation encompasses the student's belief in their ability to increase English reading comprehension skills by using known successful strategies for learning English. Awareness of one's own thinking processes is generally referred to as metacognition or metacognitive awareness (Chamot et al., 2011). Confidence builds on success, and students who are successful academically tend to stay successful in their endeavors in all areas of their education. Research with both first and second language learners reveals some of the ways of thinking that guide and assist an individual's attempts to learn more effectively (Chamot et al., 2011). Cognitively using mental processes to explicitly incorporate learning

strategies into the learning process gives students the ability to affectively combine learning and content. This study is concerned with investigating the efficacy of inferencing reading strategy, a new learning strategy for reading comprehension in ESL students.

Inferencing reading strategy is defined as guessing the meaning of unfamiliar language based on what a person knows, the content, the language and other contextual clues used to infer meaning and relevance to instruction (Chamot et al., 1999). For example, if an ESL student sees unfamiliar words, such as “to study,” the student is instructed to infer based on prior knowledge of the language and prior knowledge of the words in context with other words. Thus, the student learns that “to study” is a verb that is in close proximity with other cognates such as English, mathematics, literature, biology, music, etc., and based on this information, the student infers through guesses that the words mean “to study English”, “to study mathematics”, etc. Drawing an inference can usually help the student solve a problem and learn on their own with information already available without the need for someone else to help the student with meaning and context.

The purpose of this research study is to investigate the effect of inferencing reading strategy on TOEFL exam scores in a sample of ESL students. Specifically, this study determines if explicit instruction of inferencing reading strategy improves English reading comprehension compared to the standard course learning strategy in ESL students enrolled in an advanced level intensive reading class at a midwestern university.

Statement of the Problem

ESL students must acquire strong English reading comprehension skills to be successful in their academic careers. Unfortunately, completing an ESL program does not guarantee successful completion of the TOEFL exam (i.e., obtaining a required score of 550 or above). If an ESL student does not earn a high enough score on the TOEFL exam they are required take more ESL courses,

thereby placing a drain on the ESL program to provide more education, in addition to limiting the ESL student progress in their academic program. This study investigates the inferencing strategy for reading comprehension as a means to increasing ESL students' TOEFL exam scores.

Purpose and Research Questions

The purpose of this research study was to design and implement inferencing strategy in an Advanced Intensive Reading course in the ESL program with the expectation of increasing student performance on the TOEFL exam. The following research questions are investigated:

1. What are the characteristics of a new inferencing strategy for learning reading comprehension in ESL students?
2. What is the impact of the new inferencing strategy on ESL students' reading comprehension?
3. What are students' attitudes and perception of the course materials and delivery of the new inferencing strategy?
4. Are there any recommended changes to the new inferencing strategy to increase ESL student's reading comprehension?

The specific aims of this quasi-experimental mixed-methods research study was to: (a) Determine the impact of explicit instruction on ESL students; (b) determine if there is a difference between group receiving the inferencing instructional strategy and a group that is not receiving the instructional strategy; (c) determine motivational factors influencing students; (d) determine if the strategy produced a statistically significant difference in overall students TOEFL scores.

ESL students will have an opportunity to improve their reading comprehension skills through the design of this research and as a result be able to improve their reading comprehension skills. Students will be exposed to the inferencing strategy using Keller's ARCS motivational

model (attention, relevance, confidence, and satisfaction) with instructional emphasis and tools to help them strategically succeed in the learning process. The ARCS model will be useful for this design because of its overarching usefulness for attention, relevance, confidence and satisfaction to the instruction implemented via the inferencing strategy (Keller, 2010). Keller states if a person's motivation to achieve a goal is strong enough there is little that will deter the person from persisting until their goal is obtained (2010). This model gives a roadmap to help students achieve their goal of learning English. Through explicit instruction and motivational tools students will have the required knowledge bases needed for success. Designing the instruction using ARCS motivational strategies to help motivate students during the instructional process.

Theoretical Constructs

Reading comprehension in second language acquisition is grounded in theories that explain how learning takes place. There are several theoretical constructs that can be applied in the learning process of a second language, and this study focuses on cognitive learning theories. Cognitive learning theories focus on students' mental processes and context for learning. Cognitive learning theories are mainly concerned with how a learner obtains, processes, and uses information (Chamot et al., 1999).

Cognitive theorists view learning as an ongoing, vigorous practice in which learners select incoming information, encode it into long-term memory, and retrieve it when needed. O'Malley and Chamot (1990) have applied cognitive learning theory to students learning English, and the framework to second language acquisition is based on a comprehensive model of cognitive skill learning which has several advantages. One advantage is the broad combination of different theories and models designed for other disciplines that have been influential in second language acquisition framework (O'malley & Chamot, 1990). A second advantage to viewing second

language acquisition as a cognitive skill is “the level of specificity and the dynamic or process orientation of models of skill acquisition allow us to provide a more detailed process view of second language acquisition” than is provided by most current models of second language learning (O'malley & Chamot, 1990, pp. 19-20). A third advantage is that viewing language acquisition as a cognitive skill provides a mechanism for describing how language learning ability can be improved. A fourth and related advantage is pedagogical, and pertains to development and use of learning strategies in second language instruction.

Cognitive theorists usually suggests two types of knowledge base for long term memory: declarative and procedural (Chamot et al., 1999). Declarative knowledge is information we know and declare, and procedural knowledge refers to procedures and skills we know. It is important to understand the pedagogical differences in teaching procedural and declarative knowledge. Theorist use two cognitive learning models for how learning strategies become affective when explicitly applied to the learning process: information processing and schema theory (Chamot et al., 1999). Information processing theory refers to exposing students to information; students expands on the information, and transfers the information to long term memory by association to information in their existing knowledge base. This is what the inferencing strategy proposes to accomplish for students.

The focus of schema theory is that learning occurs as we try to organize and understand experiences according to our prior knowledge (Richey, Klein, & Tracey, 2011). Being able to store our knowledge in an organized structure is called schemata. Having a schema, or relevant prior knowledge, allows us to make predications, visualize events, draw inferences, monitor comprehension, and create summaries, learning strategies such as these are critical to understanding new information in light of existing knowledge (Chamot et al., 1999). Richey et al.

(2011) determined that schemas benefit students in the process of learning due to the systematic process involved in comprehension, storage and retrieval of new knowledge. Rumelhart and Norman (1978) outline three methods to develop or change schemata: accretion, which is basically an abstract concept added to an existing schema connecting to that schema without changing its basic concepts; tuning, which is a schema changed marginally to make it fit to the current process; and restructuring, which refers to substituting or incorporating old schema into new schema. Schema theory can be very important for teaching English to ESL students because schemas can play a major role for students wanting to learn and acquire knowledge base for the particular language being learned.

Learning takes place when knowledge is effectively transferred and used by the student for the purpose of systematically learning. “Social-cognitive models focus not only on the individual learner, but also on the social nature of learning and other factors” (Chamot et al., 1999, p. 159). These models can become very helpful for students learning ESL because they could give them a road map for knowledge acquisition and retention. Social-cognitive theory is based on complex, reciprocal interactions among behavior, environment and personal factors (Bandura, 1986). Bandura describes the personnel motivation of students who have accomplished a task as developing a sense of self-efficacy and in turn this confidence can spill over to other tasks with confidence and persistence (1986). Using appropriate strategies may help students with self-direction and motivation to learning English as a second language.

Another theorist whose work has impacted social-cognitive theory is Vygotsky’s social learning theory which suggests that “students develop mature thinking by observing how teachers and other experts approach learning tasks and by practicing expert processes with coaching from the teacher” (Chamot et al., 1999, p. 160). Social learning theory is supposed to provide support

to students as they are learning and eventually ween the students off the support to begin internalizing the tasks observed and using these tasks in their practice. Reading strategies can be taught to students, and when taught, strategies help student performance on tests of comprehension and recall (Janzen, 2011).

Teaching English to students would be easier if instructors had a better understanding of how the brain functions cognitively. There are some who believe that if instructors understood their students' cognitive structure and had better insight into how their brain works they would be effective at transferring that knowledge and so that learning English becomes a reality (McPherron & Randolph, 2014). It seems our desire to jump on the science trend has prevented us from learning about the brain (Eagleman, 2011) (Iacoboni, 2009). For example in the field of educational theory, Howard Gardner's (1983) theory of multiple intelligences has swayed many instructors, however, current research in neuroscience states that as much as seven billion different types of intelligences are out there, one for each one of us (Medina, 2011).

Definition of Key Terms and Acronyms

Attention: Keller (2010) explains attention as “capturing the interest of learners; stimulating the curiosity to learn (p.45). The individual areas of attention include: (a) the student's perceptual arousal and what is needed to capture their interest, (b) Inquiry arousal in order to maximize the learning opportunity, and (c) Instructional variability throughout the timeline of the instruction.

Confidence: Keller (2010) explains confidence as “helping the learners believe/feel that they will succeed and control their success” (p. 45). Keller's individual areas of confidence include (a) the student learning requirements, (b) the opportunities the student sees for success, and (c) the student's personal control in the situation.

Cognitive Reading Processes: “refers to any internal or mental aspects of reading” (Fitzgerald, 1995, p. 146).

Direct or Explicit Instruction: Explicit instruction is instruction that is spelled out directly to the student (O'malley & Chamot, 1990, p. 161).

English as a Second Language (ESL): English as a Second Language is a term used by many to describe English taught as a second language to non-English speaking people (Thomasen, 2003).

IELTS: International English Language Testing System. Test of English for students from countries whose first language is not English.

Inferencing: Using available information to guess meanings of new items, predict outcomes, or fill in missing information based on prior knowledge of student (O'malley & Chamot, 1990, p. 120).

Instructional Learning Strategies: Conscious goal oriented plans that call on tactics which can vary from underlying long words to creating a mental simulation to see if the author is right (Kirby, 1988).

Modeling: Modeling is where the expert (teacher) demonstrates to the novice (the student) how to use the strategy, often by thinking aloud about the goals and mental process involved (O'malley & Chamot, 1990, p. 161).

Reading Strategies: Plans for solving problems encountered in constructing meaning (Duffy, 1993).

Relevance: Keller (2010) explains relevance as “meeting the personal needs/goals of the learner to affect a positive attitude” (p. 45). Keller’s individual areas of relevance include: (a) goal orientation, (b) motive matching in order to provide student’s choice and responsibility in their learning, and (c) familiarity into the student’s life to impact significance with learning.

Satisfaction: Keller (2010) explains satisfaction as “reinforcing accomplishments with rewards (internal and external)” (p. 45). The individual areas of satisfaction include; (a) natural consequences that students experience learning a new language, (b) positive consequences from their successful experiences, and (c) student feelings after they have accomplished their learning goals.

Scaffolding Instruction: The teacher provides temporary support to students as they try out new strategies (O'malley & Chamot, 1990, p. 161).

TOEFL: Test of English as a Foreign Language.

ESL: English as a Second Language

IEP: Intensive English Programs

ARCS: Attention, Relevance, Confidence, and Satisfaction

CIS: Course Interest Survey

SORS: Survey of Reading Strategies

Summary

This study assists in learning about the deficiency in reading comprehension among international students learning ESL in American language institutes and how an inferencing strategy for reading comprehension may improve reading comprehension skills in ESL students. The next section of the study presents a comprehensive overview of the literature as it relates to the following areas: ESL learning, ESL reading comprehension, strategy use in ESL learning, and inferencing strategy in ESL learning. The literature review addresses how students learn and how students apply knowledge in an effective and precise methodology using reading strategies that will guide them in the process of achieving their language fluency goals. Another objective of the literature review is to consider motivational issues in the classroom and how teachers use

motivational perspectives to engage students and bring about an environment that is conducive to learning.

CHAPTER 2—LITERATURE REVIEW

This study is designed to aid educators to improve students' reading comprehension skills in English as a Second Language (ESL) by using inferencing reading strategy. This chapter presents a comprehensive overview of the literature as it relates to the following areas; ESL learning, ESL reading comprehension, strategy use in ESL learning, and inferencing strategy in ESL learning. Additionally, this literature review evaluates student learning and how students apply knowledge in an effective and precise methodology using reading strategies that will guide them in the process of achieving their fluency goals. Finally, literature is reviewed on motivational issues in the classroom and how teachers can use motivational perspectives to engage students and bring about an environment that is conducive to learning.

ESL Learning

English language fluency has become a necessary requirement for many people looking for academic and professional success in today's diverse education and business landscape. English has been dubbed as the "international or world language" and is the first language of approximately 380 million people worldwide; an additional 600 million people consider English as their second language (Richards, 2015). Richards notes the status of English in the world today has nothing to do with its intrinsic characteristics as a language. Rather, the spread of English has more to do with a number of historical and pragmatic factors, including globalization, economic development, communication, business and entrepreneurship, travel, popular culture, and symbolism (see Table 2).

Table 2. *Historical and Pragmatic Factors Elevating English*

Factor	Description
Historical Factors	The primary reason for the spread of English is the fact that it was the language of the British Empire and that of American expansion.
Globalization	The spread of English is often linked to globalization, since it provides for high levels of interconnectedness among world countries and integrates economies and cultures. Also, English is the dominate language among world organizations such as the United Nations, the Council of Europe, and many others...
Economic development	Many countries see English as important to their economic development. A recent report suggested that countries with poor English-language skills also have lower levels of trade, innovation and income. The report looked at 54 countries where English is not a first language and asserted that English is key to innovation and competitiveness.
Communication	The English language is convenient language for communication across national boundaries and in many professional organizations around the world.
Business and Entrepreneurship	Today, large business organizations are increasingly becoming international in their operations with English being used for all their communication within the organization. Therefore, most, if not all, the English learners requires knowledge of English to enter the workforce and advance in their own countries. Professional need to be fluent in English to compete the world economy.
Global English language teaching industry	The spread of English is supported by a global industry that is fed by publishers, private and public language-teaching institutions, and testing organizations making billions of dollars.
Travel, popular culture, media, and symbolism	Today's world traveler, expression of western culture, and readers of international text need to have access to everything in English. English is seen as a symbol of globalization, modernization, technical innovation and progress. Therefore, educational planners believe that English should have a significant role in a national curriculum.

Note. From Richards (2015).

Effective ESL instruction requires that students stay on task, stay motivated, and stay engaged to achieve the objectives of the course (Keller, 2010). It is crucial that an ESL instructional designer be aware of learner characteristics when designing instructional activities (Cennamo & Kalk, 2005) because ESL students may lose motivation to learn English if left alone. Furthermore, student success in learning new skills, such as second language fluency, is positively impacted by

student active participation. With a long term learning process such as the mastery of a second language, student success is dependent on motivation; without sufficient motivation, even individuals with the most remarkable abilities cannot achieve their long term educational goals (Dörnyei & Kubanyiova, 2014).

Motivation is an essential component of the learning process for students to succeed in learning English. Research on motivation over the last 50 years has divided the evolution of motivation research into 3 broad phases: the social psychological period (1959-1990), which was initiated and characterized by the work of psychologist Robert Gardner; the cognitive-situated period (during the 1990s), which widened the perspective of the study of second language motivation by importing a variety of cognitive theories from educational psychology; and the new socio-dynamic approaches (2000's) which basically characterize the evolution of motivation and the relationship between motivation and identity (Dörnyei & Ushioda, 2011). Keller (2010) tells us that if the person's motivation to achieve a goal is strong enough, there is little that will deter the person from accomplishing their goal. A motivated and engaged student is essential to the pedagogical process, and when coupled with a teacher who is qualified and able to synthesize learning objectives with effective course content, students have a strong probability of achieving course learning goals (Biggs & Tang, 2011).

The establishment of a national curriculum standard is a very popular component in the field of ESL today. In a study conducted in 1997, ESL students identified three major goals (Chamot et al., 1999):

1. Using English for communication in social settings
2. Using English to learn subject matter content
3. Using English in culturally appropriate ways.

Each of these three ESL goals is accompanied by three standards that identify types of knowledge and skills needed to reach that goal.

Metacognition is an important aspect of learning ESL. The goal of learning any language is embedded in a student's awareness of their own thinking and learning. Metacognition assists students in developing awareness and thus control of their learning (Chamot et al., 1999). When students take control of their educational learning, strategies and time, they may accomplish their academic goals faster than those that do not take control. Jill Fitzgerald (1995) discussed two factors which might critically affect second-language reading processes and therefore impede generalizations about selected second-language cognitions across certain target language and certain language-learning settings: (1) the target language to be learned, and (2) the sociopolitical context in which the language is learned. For example, the success of ESL fluency is dependent on the target second language being learned and the correlation between first and second language skills.

Fitzgerald (1995) reviewed 67 research projects conducted over several years, focusing on an in-depth integration of findings from research on cognitive reading processes of ESL learners in the U.S. Fitzgerald's review identified a common element in several of the studies she reviewed: "vocabulary knowledge maybe a highly significant variable in United States ESL readers' success". This review emerged with one main theme regarding reading comprehension cognitive strategy use: ESL readers tend to monitor their comprehension. This monitoring process, described as evaluate, act and check (Fitzgerald, 1995), recognizes problems, identifies problem sources, establishes strategic plans, attempts to solve the problems, and revises problem recognition to achieve a solution.

As noted, English fluency is important for international students to succeed in an academic setting. One major path to English language proficiency is the acquisition of reading comprehension skills via self-directed reading eventually supplemented by reading in a specific area of interest (Karshen, 2011). According to John Keller (2010), a major hurdle in learning a new skill is lack of motivation (i.e., internal drive to pursue a specific goal).

According to Keller (2010), motivational concepts may belong to one domain or another. ESL students need an organized, systematic and interesting process for learning English. Keller's ARCS motivational design model focuses on students' attitude, motives, and expectations via four components: attention, relevance, confidence and satisfaction. Keller's research suggests the ARCS model of motivation may be appropriate for instructional design because some tasks are boring and learners need these motivational components to remain engaged with learning. Specifically, Keller describes students' learning behavior as extrinsically motivated to learn the task for ulterior motives, such as learning English as a second language, while at the same intrinsically motivated to learn for the sole purpose of succeeding in learning.

ESL Reading Comprehension

Acquisition of ESL reading comprehension is more likely to occur if the direct or explicit model of instruction is part of teacher's repertoire of teaching methods (Rupley, Blair, & Nichols, 2009). According to the National Institute of Child Health and Human Development (2000), direct or explicit instruction has been shown to be effective in teaching major components of the reading process; phonemics awareness, phonics, fluency, vocabulary, and reading comprehension. It further draws distinctions between explicit and implicit learning originated in the field of cognitive psychology (Richards, 2015). Richard (2015) suggests that second language students use both explicit and implicit knowledge when learning the second language, and that the ability to use

either explicit or implicit language knowledge is procedural in nature. Other researchers recommend that instruction in learning strategies be explicit rather than implicit (O'malley & Chamot, 1990).

One of the biggest challenges ESL teachers face is trying to understand the extent of the struggles international students encounter. One fundamental struggle ESL students face is lack of reading skills in the language acquisition process (Klingner, Hoover, & Baca, 2008). Students with poor reading skills in their first language are likely to have similar problems when trying to learn ESL (Richards, 2015). Specifically, in a recent study of ESL acquisition in students from 57 countries, students completed a survey measuring ESL reading ability on a five-point scale (1= low level reading ability, 5=fluent reading ability), many of the countries assessed had students with low reading ability and serious difficulty reading and communicating in their native language (Richards, 2015). Thus, reading ability in the native language appears to be an important precursor to learning reading in the second language. Today, reading is taught based on the knowledge that learners must develop effective analytical processing, problem-solving, and critical thinking (Richards, 2015).

In everyday life, people use literacy in every area of communication at home, work, school, and communities. Richards (2015) breaks down the use of literacy. As shown in Table 3, reading comprehension is essential for a variety of reasons, including reading for everyday activities, reading for learning about things, reading for life purposes, reading for leisure and pleasure, reading for study purposes, and reading for work purposes.

Table 3. *Historical and Pragmatic Factors for Reading*

Reasons for Reading	Examples
For everyday activities	<ul style="list-style-type: none"> • Reading a bus timetable • Reading instructions on food packages • Reading a sign
For learning about things	<ul style="list-style-type: none"> • Going online to get information about people or places • Getting a recipe off the internet • Reading about travel destination
For life purposes	<ul style="list-style-type: none"> • Reading a magazine • Studying the driving manual before the driving test • Reading the newspaper • Reading membership requirements for a gym
For leisure and pleasure	<ul style="list-style-type: none"> • Reading any kind of book for leisure • Reading religious text
For study purposes	<ul style="list-style-type: none"> • Reading an article • Reading textbook • Researching on the internet or in a library
For work purposes	<ul style="list-style-type: none"> • Reading a report • Reading emails • Reading instructions

For academic purposes, reading is critical for second language acquisition in ESL students. According to Richards (2015), academic reading focuses on the role of texts as vehicles of information; academic reading is dependent on both good linguistic knowledge and reading skills. When students are able to effectively read and comprehend they can increase their knowledge base and become more organized in their knowledge of both academic and technical vocabulary. Reading comprehension is also important for awareness of the organization of a textbook, ability to read information and retain it for future uses, ability to analyze and synthesize new information, and ability to apply knowledge obtained from reading to real life situations (Richards, 2015). These essential components merge together to enhance the experience of students for their success in accomplishing their educational goals.

Namhee Suk (2016) examined the positive role that reading comprehension plays in the learning process of international students. Suk investigated the impact of extensive reading as an

integrated curricular component in reading development on different areas of second language learning over 15-week semester in a Korean university. The purpose of this study was to investigate differences in reading comprehension, reading rate and vocabulary improvement between control and experimental students. The participants were 171 Korean ESL university students enrolled in four two-credit English classes over a 15-week semester. This quasi-experimental research design used four intact English reading classes: two controlled and two experimental. The two controlled classes were designated as intensive reading classes; the other two classes were designated as extensive reading classes. Both controlled and experimental students were given 70 minutes from the ESL book, *Real Reading 3: Creating an Authentic Reading Experience* (Bonesteel, 2011). The difference between groups occurred during the last 30 minutes of class where instruction was given. For the control group, the last 30 minutes of instruction was concentrated on review of vocabulary from previous sections, taking a vocabulary quiz, and analyzing challenges through sentence structure that appeared in text. For the experimental group, the last 30 minutes of instruction centered on extensive reading activities including silent reading, writing a paper in three minutes, examining book blurbs, listening to a story, and writing a response. The study research question asked what the difference is between integrated extensive reading and solely intensive reading on second language learning after the 15-week semester. The researcher used pretest and posttest scores to measure the progress of the students. Study results found students in the extensive reading classes showed a significant improvement in reading comprehension compared to students in the intensive reading classes (Suk, 2016).

In contrast to the research by Suk (2016) which studied an intervention for improving reading comprehension in ESL students, research by Anderson (2015) investigated the amount of

reading expected from ESL students in the first course of their major, the expectations faculty have for ESL students' reading in their selected major, and faculty perceptions of the greatest reading challenges ESL students experience in the first course of their selected major. Study participants were 157 ESL students from 10 doctorate-granting institutions, 10 master's degree-granting institutions and 10 bachelor degree-granting institutions that enroll large numbers of international students. Also, the research looked at five very popular major among international students: Biology, Business, Computer Science, Engineering, and Psychology. Study results addressed three expectations instructors have of their ESL students, and what these expectations presumably mean to international students regarding their reading comprehension success. The first expectation is that students will understand course content through the reading assignments. Second expectation is that students will apply new knowledge gained from reading. The third expectation is that students will use the reading assignments to prepare for lectures and labs (Anderson, 2015).

The difference between the Suk (2016) and Anderson (2105) studies underscores some of the issues with effectively teaching reading comprehension to ESL students, especially with regards to teaching reading comprehension versus faculty expectations for ESL student competency with regard to reading comprehension. Anderson identified several challenges instructors face from their international students regarding reading comprehension. These include lack of ability to read specific texts, lack of motivation, lacking critical thinking skills, following simple directions, and being an actual ESL student (see Table 4). Anderson summarized four major implications from this research. First, students need to be exposed to more expository texts. Second, students need more opportunities to read discipline-specific genres they will encounter in their academic choices. Third, student motivation is a big factor for ESL student involvement with the reading. Finally, students must become strategic readers (Anderson, 2015).

Table 4. *Overall Reading Challenges*

Challenges
Lack of ability to read discipline-specific genre
Lack of motivation
Inability to read strategically
Taking adequate time to complete the reading
Understanding key vocabulary
Being an ESL student
Lack of academic preparation
Reaching basic comprehension
Reading to learn
Reading graphs
Handling the amount of reading
Lacking critical thinking skills
Relying alone on lectures to get new information
Following directions
Accessing the texts

Note. Adapted from Anderson (2015).

Learning Strategies

Learning a second language has been associated with a certain innate ability a person might have for learning the language. Educators didn't think that applying certain cognitive abilities to the process of learning would contribute to the acquisition of a second language until about 1975 when Rubin put forth the notion that strategies might play a major role in the acquisition of a second language (Rubin, 1975). This concept established the knowledge base for language acquisition processes that would open research to strategy base language acquisition for decades to come.

In 1986, Weinstein and Mayer (1986) defined learning strategies as behaviors and thoughts in which a learner engages and which are intended to influence the learner's encoding process. Furthermore, the goal of any particular learning strategy for learners is for the learning strategy to positively impact the way in which the learner selects, acquires, organizes, and integrates new knowledge (Weinstein & Mayer, 1986). Knowledge of learning strategies helps teachers help

students accomplish their academic goals by teaching them how to learn, remember, think and stay motivated to learn. Weinstein and Mayer identified five categories of learning strategies: (1) rehearsal strategies such as copying, underlining, or shadowing; (2) elaboration strategies such as paraphrasing or summarizing; (3) organizational strategies such as outlining or creating a hierarchy; (4) comprehension monitoring strategies such as checking for comprehension failures; and (5) affective strategies such as being alert and relaxed. The role of learning strategies in acquisition of information is generally understood by referencing the information processing framework for learning (O'malley & Chamot, 1990). O'malley and Chamot's (1990) information processing framework for learning explains how information is encoded and stored in memory. These researchers concluded that new information is acquired through a four-stage encoding process involving selection, acquisition, construction, and integration (Weinstein & Mayer, 1986). Whereas selection and acquisition determine how much information is learned, construction and integration determine what is learned and how it is organized (O'malley & Chamot, 1990). A review of these four stages is presented in Table 5.

Table 5. *Four-Stage Encoding Process*

Stages	Review
Selection	Through selection students focus on issues around them that make sense and transfer information into their working memory.
Acquisition	In acquisition, students actively transfer information from working memory into long-term memory for permanent storage.
Construction	In construction, students are always making connections between ideas contained in working memory. This process makes the transfer into long term memory much more effective. This creates the schema needed to achieve the long-term retention necessary for transfer of knowledge.
Integration	In integration, the student is actively searching for prior knowledge in the long-term memory and transfers needed knowledge to working memory.

Note. Adapted from Weinstein and Mayer (1986).

Research has shown that teachers who model and explain the target behavior to be learned, such as learning reading comprehension, helps students learn the target behavior, such as learning to become a strategic reader (O'malley & Chamot, 1990). Furthermore, McPherron and Randolph (2014) discuss the importance of describing the learning environment where information is going to be encoded in the student's memory. They describe several factors which are valuable to teachers when an adequate transfer of knowledge is needed. These factors range from energizing the class every 20 minutes with yoga moves, to mirroring behaviors of the instructor. Since the 1980s, research on reading comprehension in ESL students started to focus on the strategy used to improve reading comprehension (Chamot et al., 2011).

Many researchers suggest the use of learning strategies in ESL classrooms. However, there is a lack of material on learning strategies readily available for the ESL instructor (O'malley & Chamot, 1990). In most cases, instructors are having to design, develop, and implement an instructional strategy process with their students. Learning strategy scope and sequence is the first step toward developing a curriculum that integrates learning strategies with other instructional objectives (O'malley & Chamot, 1990). Learning strategies for effective instruction of reading comprehension in ESL students are related to many issues such as money, family, status, academic requirements, etc. In some instances, an effective learning strategy cannot be found and some ESL learners end up returning to their home country without acquiring reading comprehension and without acquiring their academic degree. In many cases, ESL students' success in the academic world shows that when ESL students have mastered the English language they have a higher probability of successfully completing their academic studies and graduating in any field. Thus, a question can be asked as to, What can ESL programs do to improve learning strategies for reading comprehension so that the ESL student can succeed in achieving their academic goal?

One study examined the metacognitive strategic knowledge possessed by Chinese and Taiwanese ESL students studying in a North American university (Poole, 2012). The main purpose of Poole's (2012) study was to discover the factors that influence students' decisions on whether to use reading strategies. Seven students from a large North American university served as research participants. All students had met the TOEFL exam score requirement of 550, however, the students still struggled with English fluency inside and outside the classroom. Participants were enrolled in both graduate and under-graduate programs, and data were collected in an advanced ESL course from students who completed a strategy inventory called the Survey of Reading Strategies, SORS (Poole, 2012). The SORS was designed to measure ESL students' awareness of reading strategies and their metacognitive awareness and perceived use of strategies while reading academic text or materials (Mokhtari & Sheorey, 2002). The SORS has been field tested and has demonstrated reliability and validity as a dependable measure of students' reading strategy use in and out of the classroom. SORS is an effective tool to enable teachers to assess students' awareness of strategy use in an attempt to help them become responsible readers. The SORS was used in the Poole study to identify factors that influence students' choice to utilize or avoid reading strategies. Study results indicated students' decisions on whether or not to use reading strategies depended on four ideas: time, text characteristics, memory, and comprehension. The study had several implications which may be useful in improving students' English reading comprehension skills. First, students need to be motivated to use strategies in reading process. Second, students need to use reading strategies that do not impede them from completing their reading tasks. Third, students need to use reading strategies that still require instructor input to help students' complete assigned reading. Four, instructors need to understand the role of prior lexical knowledge in students' use of reading strategies (Dole, Duffy, & Roehler, 1991).

Inferencing Reading Strategy

Inferencing reading strategy is a reading strategy designed to improve reading comprehension of students. In the context of reading comprehension, inferencing is the ability to use two or more pieces of textual information to arrive at an implicit third piece of information (Kispal, 2008). Ho Cheung Lee (2013) from the University of Hong Kong states that the ability to draw inferences during and after reading has significant positive effects on reading competence in ESL students. Inferencing reading strategy involves guessing the meaning of unfamiliar language based on prior information that a student knows. This could be information from prior knowledge, language, or other “contextual clues, such as nonverbal cues and picture” (Chamot et al., 1999, p. 25). For example, Shang Min took his final in his C++ class with the hope that he doesn’t sleep during the test. Does this mean that Shang Min was up all night studying? Or was he up all night partying? Inferencing doesn’t just mean reading between the lines and coming up with a conclusion (Lee, 2013). According to Lee, making inferences from texts implies the ability to not only decode the hidden meanings of texts, but also to use world or background knowledge appropriately and to draw conclusions about them. Several researchers share this view, such as Samuels and Kamil (1984) whose view is any simple form of literal comprehension requires that we participate in inferencing. More specific is Rapp and Van den Broek (2005) who explain why drawing inferences is essentially part of textual comprehension: “A central component of successful reading is the construction of functional, coherent representation of the text in memory.....The construction of a representation may be viewed as a problem-solving process in which the reader infers relationships among ideas, events, and states that are described in the text” (p. 277).

Also, Winne (1993) affirms that inferencing is an essential element in reading comprehension because inferencing occurs whenever literal comprehension takes place.

How ESL students infer meaning from content is a very important cognitive learning strategy for students. In recent years, research has focused on the subject of inferencing and how ESL students could use inferencing to help increase their reading comprehension skills because ESL students who have acquired a high level of vocabulary knowledge possess a significant advantage in reading comprehension skills compared to those students who did not (Marcella Hu & Nassaji, 2013).

In 1975 Rubin (1975) theorized that a good language student will be more successful if he/she utilized effective learning strategies. Rubin also suggested that a good learners' communication skills give them the confidence to be able to guess with accuracy when they are uncertain. Research by Marcella and Nassaji (2013) utilized Rubin's hypothesis and "explored how successful inferences differed from unsuccessful inference in terms of the quantity and quality of strategy use and the factors affecting their success" (p. 28). The purpose of the study was twofold. First, find a relationship between ease or difficulty of word inferencing and retention; second, investigate whether the relationship between inferencing and retention is mediated by the type and frequency of the lexical inferencing strategies used.

Researchers in the Rubin (1975) study from a university in Canada were able to identify strategies from the data. There were 11 ESL student participants with majors in economics and business; nine students were from China, one student was from Malaysia, and one student was from Taiwan. All students were advanced level in English language fluency and were considered to be well-versed in reading comprehension. There were three tests used in this study. The first test tested participants on their vocabulary knowledge using Nations Vocabulary test (Nation,

2001). Marcella's and Nassaji's (2013) purpose for the vocabulary test was to ensure that the participants had a comparable level of word knowledge required for reading an academic text. A pre-test was then used to measure the students' level of familiarity with target words in the study. For the purpose of the study, an adapted version of the Vocabulary Knowledge Scale was used (Wesche & Paribakht, 2010). The Vocabulary Knowledge Scale has five different measures of students' level of knowledge of target words, however, for the purpose of their study, Marcella and Nassaji only used the first three scales. The three Vocabulary Knowledge Scales are: (1) I don't remember having seen this word before, (2) I have seen this word before, but I don't know what it means, and (3) I have seen this word and I think it means _____ (synonym or translation). The students were then given the Vocabulary Knowledge Scale as a posttest after the study, however the only answer considered correct from the scale was question number three, "I have seen this word before and I think it means _____". This provided the researcher to believe that the students' retention process was viable. All lexical inferencing behaviors were identified. These included the following:

1. Analyzing- separating the target word into its component parts;
2. Analogy- attempting to infer meaning of the target word based on its sound or form and their similarity with other words;
3. Repeating- repeating the target word or part of it;
4. Using textual clues- attempting to guess the meaning of the target word by using surrounding contextual clues;
5. Discourse knowledge- using the overall discourse to infer the target word;
6. Paraphrasing- paraphrasing part of the text that contained the target word;
7. Self-inquiry- questioning initial inferences;

8. Confirming/disconfirming-checking inferences made about the wider context;
9. Commenting-making evaluative comments about the target word;
10. Stating failure/difficulty- making statements about the failure of inferencing or the difficulty of the word;
11. Reattempting/discarding the old inference and attempting a new inference.

These strategies were then grouped into four broader categories of lexical inferencing: formed focus, meaning focused, evaluating, and monitoring strategies (see Table 6).

Table 6. *Categories of Inferencing Strategies*

Strategy	Definition	Example
Form-Focused	Strategies to make an inference based on word-form properties in the text	The assumption of perfect information precludes these changes. ‘While looking at this sentence, I think preclude means include because of the stem –clude, it means include, and preclude ...pre- is a prefix meaning before ... and this ... um ... this is not a complete sentence ...’
Meaning Focused	Strategies to make an inference according to contextual clues in the text.	Freedom of action: there is no stipulation that prevents any individual from setting up a firm to produce any good. ‘I’m not sure of what it means, however, I found the clues from “something that prevents any individual from setting up a firm to produce any good.” So it can be some difficulties, some obstacles, to prevent from individual, that is, barriers.’
Evaluating	Strategies to examine or verify the appropriateness of the inferred meaning.	The assumption of perfect information precludes these changes, ‘I think it compares with the previous passage, which says some things are unpredictable ... but it says “the assumption of perfect information ...”they can conclude some changes or exclude, preclude, or does it mean exclude?’
Monitoring	Strategies to indicate an awareness of the inferencing process and text features.	Each firm has all the information that it needs to make decisions without uncertainty on prices, wages and other issues that sway it. ‘I don’t know this word, sway. Nothing comes to my mind for the time being what this word means, I’ll read over the following context to see if I can figure it out later on ...’

Note. Adapted from Marcella Hu and Nassaji (2013, p. 63).

ESL students need to understand how they use inferencing all the time, and instructors can play a big role in helping students infer from different situations. For example, if ESL students are reading a story about a group of students driving in a car after they have had too much alcohol, the teacher might ask them to predict what will happen. As students articulate their predictions, the teacher would point out that some things may happen and other things may not necessarily happen; the teacher is also encouraging the students to fill in information about the story that has not yet been revealed (i.e., the students are making inferences). Marzano (2010) suggests that teachers or instructors can use a simple process to guide students in analyzing the effectiveness of their inferences by posing four questions shown in an elaborative interrogation table (see Table 7).

Table 7. *Four Questions for Collaborative Interrogation*

Questions	Effective inferences
What is my inference?	Students become more aware that they just made an inference. Students might make two types of inferences: <ol style="list-style-type: none"> 1. Default inference- automatic assumptions 2. Reasoned inference-conclusion we make about a topic on the basis of available information
What information did I use to make the inference?	As students contemplate this question, teachers should probe them about their thinking and guide them in articulating the premises on which they have based their inferences.
How good was my thinking?	Here students can examine the validity of their thinking. Do you think that their stories about teenagers driving drunk in which nothing bad happens? What are some other things that might happen?
Do I need to change my thinking?	Here students should consider possible changes in their thinking. The point here is not to invalidate their original inferences, but rather to help them develop the habit of continually updating their thinking as they gather new information.

Note. Adapted from (Marzano, 2010).

TOEFL Exam

Test of English as a Foreign Language (TOEFL) is a standardized exam used for measuring English language fluency in ESL students. TOEFL is typically used for enrollment purposes at universities by requiring ESL students to attain a certain criterion level of English fluency according to the TOEFL (e.g., TOEFL score of 550 or above is required for admission). TOEFL is one of the two major English-language tests in the world, the other being International English Language Testing System (IELTS). The IELTS test assesses the English language proficiency of people who want to study or work where English is spoken or written (IELTS USA).

Innovative ESL Teaching Methodologies and Models

Strategies used by ESL learners to obtain English fluency are often called language learning strategies (Nyikos, 1993). A large body of research evidence suggests that the use of language learning strategies affects how well ESL learners acquire English fluency. In a study of third and fourth graders in the United States, Chamot and El-Dinary (1999) learned that the students whose teachers rated them as the more proficient students used more metacognitive strategies than the lower rated students. In addition, the proficient students used cognitive strategies such as elaboration, prediction and inferencing in order to understand reading passages, and they changed their strategy use to fit the situation. The lower rated students continued to use particular strategies even when those strategies were not helping them succeed in learning.

The ESL instructional model developed by Chamot and O'Malley in 1986 is based on cognitive theory developed over many years of research with second language learning strategies. Chamot and O'Malley (1986) designed the Cognitive Academic Language Learning Approach (CALLA) for learners with limited academic English skills. CALLA integrates grade appropriate content topics, academic language development, and direct instruction in using learning strategies

to acquire the skills needed for becoming proficient in English. CALLA was developed for students in advanced levels of second language acquisition. It focuses on the process of language acquisition and using procedural skills for developing knowledge transfer (O'malley & Chamot, 1990). The most important area of CALLA is its focus on students who have an advanced placement in English. CALLA has three components in its curricular and instructional design: topics from the major content subjects, development of academic language skills, and direct instruction in learning strategies for both content and language (O'malley & Chamot, 1990).

Inclusion of ESL Students in the Learning Process

An ESL student plays a monumental role in the second language acquisition process. As with knowledge acquisition, learner characteristics are central to the learning of the particular content. O'Malley and Chamot (1995) note, the effects of student characteristics on instruction in learning strategies cannot be exaggerated. While they mention many student characteristics, motivation is of utmost importance to this study. Motivation encompasses a student's determination and inner drive to learn. Increasing motivation to learn is important for teaching ESL, and scholars and practitioners are interested in understanding why some learners are more motivated to learn than others. O'Malley and Chamot (1995) detail what a good language student should have in his/her arsenal of strategies to use while learning a second language. They specifically say that learning many different strategies rather than one single strategy when engaged in a learning task is more beneficial (O'Malley & Chamot, 1995, p. P. 169). Instructional strategy embodies cooperative learning techniques in which students work in small groups to develop comprehension of written text (O'Malley & Chamot, 1995).

Summary

This literature review looked at the use of explicit instruction of inferencing reading strategy to improve ESL students' English reading comprehension scores as measured by the TOEFL. This literature review is intended to link the theoretical knowledge base with research about ESL learning. It encompasses explicit instruction laced together with motivational theory and strategy use in the classroom. The research foundation is deeply connected with theory, and the results of prior research studies on learning English in ESL students affirms that use of a knowledge base formed by explicit instructional materials blended with learning strategies such as inferencing reading strategy may have a positive effect on the ESL student's acquisition of English fluency and subsequent academic success.

CHAPTER 3—METHODS

The purpose of this research study was to explore the impact of an inferencing reading strategy on English as a Second Language (ESL) students' TOEFL reading comprehension scores. The aim of this research study was to design, develop, implement and evaluate the inferencing reading strategy implemented over 10 weeks of instruction. This quasi-experimental study used quantitative data collection comprised of pre- and posttest TOEFL reading section scores, Course Interest Survey (CIS) student perceptions scores, and demographic survey to answer the following research questions:

1. What are the characteristics of a new inferencing strategy for learning reading comprehension in ESL students?
2. What is the impact of the new inferencing strategy on ESL students' reading comprehension?
3. What are students' attitudes and perception of the course materials and delivery of the new inferencing strategy?
4. Are there any recommended changes to the new inferencing strategy to increase ESL student's reading comprehension?

This chapter provides a description of the study research methodology in terms of rationale for quasi-experimental research, setting, population, sampling procedures, research design, and data collection methods. Research with human participants was approved by the Wayne State University and Lawrence Technological University Institutional Review Boards (See Appendix B).

Research Design

This quasi-experimental study used existing groups of students in two sections of level 4 reading course. The sections were defined as an experimental section and a control section, thereby creating a quasi-experimental research design. Each section was capped at 20 students. Comparisons in student performance on reading comprehension skills occurred via differences in pre-and posttest TOEFL exams, and comparisons of student perceptions of course content and delivery occurred via differences in Course Interest Survey scores between two sections. Students in the experimental section received a new inferencing reading strategy, whereas students in the control section received current course content unchanged from previous terms. Students in both sections utilized the same course text.

The main aim of this study was to investigate the relationship between the inferencing reading strategy (independent variable) and the TOEFL test reading comprehension score (dependent variable). A secondary aim was to investigate the relationship between the inferencing reading strategy and student perception of the strategy. As shown in Figure 1, the study design was a quasi-experimental design with students in the inferencing ready strategy group serving as the experimental group, and students in the current reading strategy group serving as the control group. The TOEFL test was administered pre- and post-reading strategy, and the pre-post test score difference was examined.

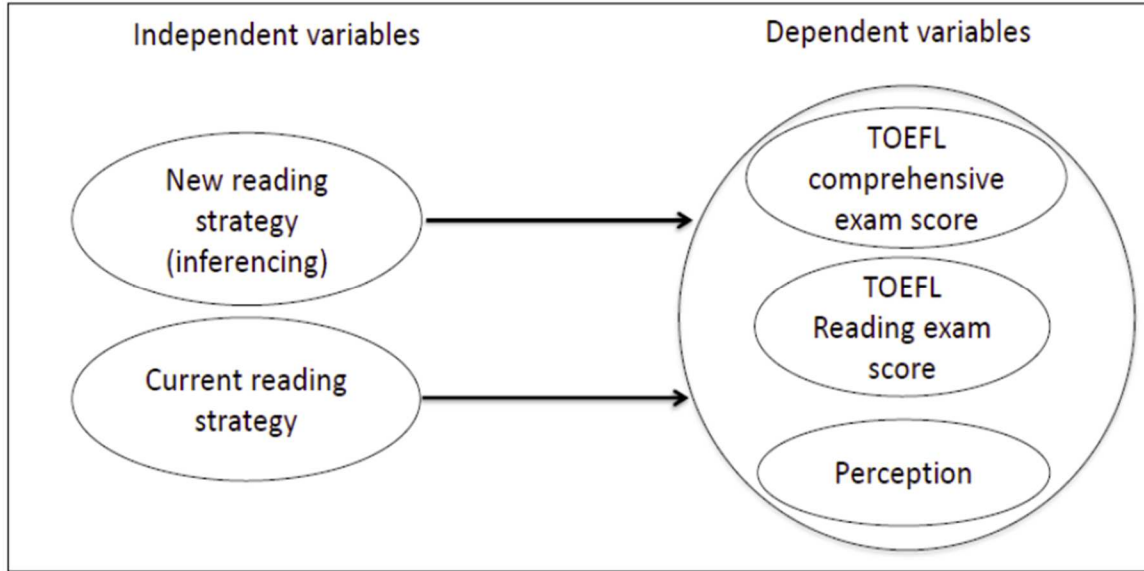


Figure 1. Study design

Setting

This research study took place at Lawrence Technological University (LTU), a small private university in the mid-west during the Fall 2017 semester. LTU has four colleges: Arts and Sciences, Engineering, Architecture, and Management. There are approximately 3900 students, 25% of whom are international students. The university accepts transfer students who have been learning ESL at other institutions and students who have just arrived in the USA to study LTU. Degrees are awarded at the associates, bachelors, masters and doctoral levels in the areas of architecture, business, engineering, science, and technology. Students who graduate with a degree from this LTU have the potential to earn more money in their homeland. This reason alone makes this university a popular destination for many international students.

LTU's student population in the fall 2017 semester contained international students from 44 different countries. Most of these students came from countries where English is not the primary language. Most international students at LTU are from India, Saudi Arabia, Brazil, and China.

The ESL Program at the LTU consists of four levels: level 1, level 2, level 3, and level 4 (see Table 8). The international student body has the opportunity to be full time or part time ESL depending on their test scores when admitted. The criteria used to determine which courses are needed in the ESL program is based on the information from the TOEFL or IELTS. Table 8 presents an overview of the ESL proficiency criteria.

Table 8. *ESL Proficiency Table*

ESL Level	TOEFL IPT	TOEFL iBT	IELTS	ESL Courses Undergrad	ESL Courses Graduate
No ESL Required	550 or above	79 or above	6.5 or above	No ESL needed	No ESL needed
Level 4 ESL	500-549	60-78	6	3	2
Level 3 ESL	451-499	46-59	5.5	6	6
Level 2 ESL	450 -400	36-45	5	6	6
Level 1 ESL	399 or below	36 or below	4.5 or below	6	6

Study Population and Sample

The target population for this study was ESL students having transferred from another ESL institution or new students arriving on campus from their home countries, having passed level 3 ESL classes, and/or student who have at least a 500 on TOEFL or 6.0 on IELTS exams. These students range in age and educational levels. They could be undergraduate first year students, transfer students, or graduate students. Students assessed with poor reading comprehension skills based on their TOEFL or IELTS score are placed in the level 4 reading courses. For example, if a student has 520 on TOEFL based on their score report for the individual scores on each section of the test, the student is placed in the level 4 reading class if the reading score is the lowest score on the exam.

The ESL Program offers two sections of level 4 reading, thereby providing the opportunity to investigate the inferencing reading strategy in one section, and compare the student performance in this section to student performance in the non-inferencing strategy section (i.e, the normal

course content). I assigned the inferencing strategy section as the experimental section and the normal course as the control section. Each section was capped at 30 students. Student placement in either the experimental or control sections was based on time schedule of the students (i.e., the two sections were not offered at the same time). Thus, the study sample was not random since the students picked the section they wanted.

Study Sampling Procedure

As the director of the ESL Program at LTU and as the study researcher I have firsthand knowledge of course structure and processes. The study sampling procedure began during orientation week when students arrived on campus and registered for courses. All ESL students assigned to level 4 reading were invited to participate in this study. After obtaining voluntary consent to participate, level 4 reading ESL students were assigned to the experimental or control section level 4 reading course based on their preferred course schedule. Students were also assigned a participant number for identification in the study.


Study Procedure

This study was conducted with a random sample of ESL students assigned to level 4 reading based on their incoming TOEFL or IELTS score. Students were assigned to one of two section of a level 4 reading course, Level 4 Reading. Each course was taught by the same full time ESL faculty at LTU who agreed to participate in the study as course instructor.

Inferencing Strategy curriculum. The experimental group's instructional materials were designed to help improve their reading comprehension skills. Table 9 describes the instructional content used during the study period with the experimental group.

Table 9. *Inferencing Curriculum*

Week	Activity
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Week 1	Have a student stand in front of the class and ask what the rest of the students could tell about him or her, just by looking. For example, his eyesight is not very good (he is wearing glasses). He likes the Tigers (he is wearing a Detroit Tigers T-shirt). He walked in some mud on his way to school (there is some mud caked on his shoes).
Week 2	 <p>Instructor: Students asked what they can infer from this picture. Student answers:</p> <ul style="list-style-type: none"> -Olympic Logo on his shirt -He is from Ethiopia -He is a runner -He is at the Olympics -He is in Rio Brazil at the 2016 Summer Olympics
Week 3	Make inferences to understand someone's character what that character means. Select reading materials relevant to this activity
Week 4	Reading text that help with understanding different characters. Students play act certain characters from the readings.
Week 5	Students practiced creating inferences as well as identifying them by issuing a challenge.
Week 6	Separated students into four groups and assigned each group a mystery from the book. They had ten minutes to read the mystery and solve it from the information given. Students came up with a list of the facts and inferences from the text that helped them solve the mystery.
Week 7	Read short text and infer what the author's purpose for writing the text.
Week 8	Iteration of past activities
Week 9	Iteration of past activities
Week 10	Posttest and Course Interest Survey

Instructor coaching. For this research study to be implemented, I needed to coach the instructors. Fortunately, in the fall of 2017 one instructor, Scott Corp was scheduled to teach both sections of level 4 reading course, Advanced Intensive Reading. Scott has a Master's Degree in Teaching English to Speakers of Other Languages (TESOL) and has over 15 years of experience teaching ESL, including 10 years of ESL teaching experience in Japan. During Scott's time in Japan he taught English in the public schools (Elementary and Middle school) and at Nagoya

University. Scott is an accomplished ESL instructor who understands students and knows that the secret to building student success is to create engaging and motivating lesson plans that determine positive outcomes for all students in his class. In order for Scott to participate in this research I needed to bring him on board with me and my research agenda. Scott and I spent some time together designing a lesson plan that included several parts for the ten weeks we would implement this content to student.

I acquired permission from Scott to observe his class as a way to gather information on the research. I advised Scott that it would help me observe what students are doing with the instruction. I also told Scott about the valuable insights that we might collect which might help him in the future with his pedagogy. I wanted Scott to feel comfortable and accepting of this process because I needed his participation in order for this research to be completed. I didn't want him to feel I was uprooting his years of work in the classroom. I felt the need to reassure Scott that I was a guest in his class when I would be there and will be cognizant of his leadership, classroom rules and procedures. Finally, the wealth of wisdom that comes from years of teaching and learning cannot be underestimated. During these coaching sessions with Scott I learned a lot about him and how lucky I was to be working with someone with so much experience and knowledge about students. As a coach and colleague, I have the good fortune to learn from Scott and pass on his wisdom through this research. I wanted to cultivate this relationship and grow it to gain insight into the important work we do to advance student learning.

Procedure. The study procedure is shown in Table 10. As shown, the study occurred during ten weeks of LTU's fall semester (September-November). During week 1, students had the opportunity to review and ask questions about the class and the research study. Students also completed the TEOFL exam pretest. After the pretest, students in the control section continued

with the regular formatted class; students in the experimental section were introduced to the inferencing reading strategy as an explicit learning objective for improving reading comprehension skills. Experts in the field of ESL support the hypothesis that inferencing plays a major role in learning a second language and may be very effective at preparing students for the transition into the subsequent content classes taught in English (Chamot et al., 1999). Beginning with week two and continuing throughout the remaining nine weeks, students in the experimental section used inferencing in all areas of their reading assignments. Students were informed that the inferencing reading strategy had a strong potential for improving their reading comprehension. Lee (2013) said, “drawing inferences from text is a reading strategy that requires readers to make a connection to one’s experience and world knowledge to make sense of the implicit message from the text. Some inferences are not easy to make from certain text, and that is why the strategy is sometimes regarded as an advanced one” (p. 719). From weeks three through nine students in the experimental section read short stories and used inferencing to infer meaning from words they read. Inferencing involved creating inferences of the story characters, setting, and content. Students in both the experimental and control sections used the same text book, *Pathways: Reading, Writing, & Critical Thinking* (Vargo & Blass, 2013). Students in the control section were taught the course with lesson plans directly from the book, whereas students in the experimental section had explicit instruction and exercises at the beginning of each unit for inferencing strategy use. During week ten, all students completed the Course Interest Survey and the posttest TOEFL exam.

Table 10. *Updated ten week Curriculum*

Week	Class	Experimental Section 01	Control Group 02
0		Provide consent forms to all participants	
1	9/19	Study debriefing	
	9/21	Pretest Placement exam	
2	9/26	Training on inferencing strategy Introduction to inferencing Researcher Observation (Visit 1)	Making comparisons, class activity write about similarities and differences.
	9/28	Activities related to inferencing researcher Observation (Visit 2)	Skim to make predictions and synthesize to identify similarities.
3	10/3	Reading a short story using inferencing. Emotional involvement in the story will become relevant to learners' perceptions and attitude. Infer to measure how certain the author is? Degree of certainty	Analyze and evaluate evidence. Interpret maps and contextual information.
	10/5	Reading different types of text and developing inferring questions about text	Write opinion paragraphs. Interpret information in multimodal text.
4	10/10	Interpret the author's words to understand intentions	Use parallel structures and write an essay on theme provided by instructor
	10/12	Additional activities on intentions of authors	Analyze cause and effects, write a cause and effect essay.
5	10/17	Students practice creating inferences by issuing a challenge (Visit 3)	Interpret figurative language and identify similes.
	10/12	Challenge Cont.	Evaluate an argument and understand infographics.
6	10/24	Make inferences to understand someone's character	Interpret visual information
	10/26	Read more stories that require inferences	Read outlines and write from outlines
7	10/31	Infer the purpose of the text and author meaning; researcher observation (visit 4)	Understand timelines from information
	11/2	Applying inferencing to text	Identify main ideas and key detail in stories.
8	11/14	Strategic use of inferencing to text	Identify meaning from context, identify adverbial phrases/clauses
	11/16	More reading and review of explicit inference Strategy	Use past forms for narration and plan and write a descriptive narrative

9	11/21	Review work and activities from the semester
10	11/28	Posttest Formal TOEFL Test Students take Course Interest survey
	11/30	Housekeeping

Study Measures

Demographic survey. The demographic survey used in this study had 8 questions (see Appendix E): Age, gender, nationality, residents (on versus off campus residency), academic program (undergraduate versus graduate), high school GPA, number of ESL courses in the current term, and number of academic courses in the current term.

TOEFL exam. The TOEFL exam is a formal language standardized exam used around the world as a measure of English proficiency. The TOEFL exam is accepted in many colleges/universities around the globe as a formal English proficiency indicator for students' applying to American colleges/universities. The TOEFL exam, first developed in 1963, is used to assess the English proficiency of students whose native language is not English (Peirce, 1992). The TOEFL is administered over a two-hour period. It consists of three sections: listening, structure, and reading comprehension. Students have 35 minutes on the listening section, 25 minutes on the structure section and 55 minutes on the reading section. Students in this study just completed the reading section of the TOEFL.

The course interest survey (CIS). The CIS was developed by Keller (2010) to measure students' attitudes and perceptions course materials and delivery of instructor-led instructional materials. Keller's goal with the CIS was to measure how motivated students are with respect to a particular course or instructional method (Keller, 2010). The effectiveness of the CIS is due to its situation-specific self-report measures that can be used to estimate respondent motivational attitudes of course content and delivery (Kacin, 2013). The CIS is comprised of 33 items coded

along a 5-point Likert scale (see Table 10). To increase internal validity, 9 of the 33 items are on the CIS are reverse-scored (i.e., items are written in the negative). As shown in Table 11, the CIS is organized in four dimensions: attention, relevance, confidence and satisfaction (ARCS). Data from the CIS are useful to understanding why a particular intervention may have an effect. The CIS was administered to all students at the end of the course and after the posttest TOEFL exam was administered. According to Keller (2010) the CIS can be scored to obtain a total scale score and subscale scores for each of the four ARCS dimensions (Keller, 1987).

Table 11. *CIS Scoring Guide*

Attention	Relevance	Confidence	Satisfaction
1	2	3	7 (reverse)
4 (reverse)	5	6 (reverse)	12
10	8 (reverse)	9	14
15	13	11 (reverse)	16
21	20	17 (reverse)	18
24	22	27	19
26 (reverse)	23	30	31 (reverse)
29	25 (reverse)	34	32
	28		33

Instructor coaching and class observation were the methods used to answer research questions one and four. The data collected from my observations and the coaching of the instructor was instrumental in answering two of my research questions.

Data Collection

Data were collected from all students in the study using the TOEFL exam and the CIS. Reading comprehension was measured pre- and post-course via the TOEFL exam, and student perception of the course content and course delivery was measured via the CIS. Both exams were completed via paper-and-pencil surveys. The TOEFL exam pretest was administered during week

one of the semester, and the TOEFL exam posttest and the CIS were administered at the end of the semester during week ten.

Data for this study were also obtained from researcher observations of the experimental group during the ten weeks of instruction. The observations took place in the classroom during the instructional times where the instructor was lecturing and having the students participating in activities on the inferencing strategy. I took notes while I was observing students and had a checklist of when the inferencing strategy was used and how it was used. The goal of the observations was to understand student attitudes perceptions and attitudes of the instruction. According to Burns (2010), observational data collection involves noticing unusual happenings, and seeing things in ways that haven't been consciously noted before making familiar things seem strange. Therefore, as an observer in the classroom I was able to look at everything happening with impartiality. I wanted to observe different types of actions, such as how the teacher set up the reading class, the activities the students participated in, how the students reacted to the content, and reactions to the reading materials by using the inferencing strategy. My objective in these observations was to keep my research questions in mind as I observed the inferencing reading strategy in the class by the instructor and the students.

Data Analysis

Data were analyzed quantitatively using descriptive and inferential statistics. All statistical analyses were conducted via SPSS (25). Descriptive statistics were comprised of frequency analysis of categorical survey data on student demographic characteristics, mean and standard deviations of TOEFL exam scores and CIS scores across the student demographic characteristics, and reliability analysis of the CIS in the study sample via Cronbach's alpha test of internal consistency reliability. To control for violations of normality, inferential statistics were comprised

of both independent samples *t*-test and ANOVA *F*-test for normality, and Mann-Whitney *U*-test and Kruskal-Wallis *H*-test for non-normality. Inferential statistics tested the difference in TOEFL and CIS scores across the sample demographic characteristics. Table 12 presents a summary of the data analysis methods for the study research questions.

The class observations occurred during the 10 weeks of the study. As an observer I attended four class sessions from beginning to the end. This totaled eight hours of instruction. The observations provided the necessary data to answer some important questions about the instructional content the students were learning in the experimental group. Using protocol analysis as method to analyze how the students were collaborating with the instructor was an effective method to answer questions one and four in my research study.

To answer research questions one and four I used protocol analysis methodology for the participants' perceptions of their experiences during the instruction. Protocol analysis follows a research-through-design approach (Basballe & Halskov, 2012; Halskov, 2011; Dalsgaard, 2010). Using this method, I documented the instructional content students were engaged in during the class observations.

Table 12. *Data Analysis Methods for Study Questions*

Research Questions	Data Sources	Collection Methods	Dependent Variable	Independent Variable	Analysis Method
Q1) What are the characteristics of a new inferencing strategy for learning reading comprehension in ESL students?	Researcher	Researcher observations	n/a	n/a	Protocol Analysis
Q2) What is the impact of the new inferencing strategy on ESL students'	Students	TOEFL-Pretest & Posttest	TOEFL	-Inferencing strategy -Current strategy	<i>t</i> -test, <i>F</i> -test <i>U</i> -test, <i>H</i> -test

reading
comprehension?

Q3) What are students' attitudes and perception of the course materials and delivery of the new inferencing strategy?	Students	Course Interest Survey (CIS) Researcher observations	CIS	-Inferencing strategy -Current strategy	<i>F</i> -test <i>H</i> -test
Q4) Are there any recommended changes to the new inferencing strategy to increase ESL student's reading comprehension?	Researcher	Researcher observations	n/a	n/a	Protocol Analysis

Summary

This mixed methods quasi-experimental study investigated reading comprehension in two groups of ESL students in a level 4 intensive reading class at a private mid-western university. The study took place in the fall semester of 2017 and spanned ten weeks. Students in the experimental section of the course received an inferencing strategy for reading, and students in the control section received the current course materials for reading. Data on reading comprehension were obtained pre- and post-course via the TOEFL exam reading section. Data were also collected on student perceptions using the CIS and via researcher observations. Data were analyzed using descriptive and inferential statistics. Some of the data was also collected from class observations and Course Interest Survey and analyzed by Protocol Analysis. The next chapter presents the study results.

CHAPTER 4—RESULTS

Introduction

The effects of an inferencing strategy intervention for reading comprehension on TOEFL reading comprehension scores was investigated in a sample of English as a Second Language (ESL) students in two sections of level 4 reading at Lawrence Technological University in the U.S. Both course sections were taught by the same instructor. The experimental section used the inferencing strategy as a primary curriculum component to teach reading; the control section used the current curriculum for teaching reading centered on the course text. Students in both sections completed pre- and post-course TOEFL exam reading comprehension section. Student attitudes and perceptions of the course were measured by a post-course Course Interest Survey (CIS) and by researcher observations. Pre-Post differences in TOEFL scores and were examined between the two course sections. Comparisons were made of the CIS score between course sections and across demographic characteristics.

The study results are presented in this chapter. First, descriptive statistics of the sample demographic characteristics, TOEFL scores and CIS scores are presented. Next, results of inferential statistics comparing differences in TOEFL and CIS scores between sections and across demographic characteristics are presented. Finally, researcher observations of student and instructor behaviors are presented.

Descriptive Statistics

Demographic characteristics. Table 13 presents the demographic characteristics of the sample in terms of group assignment, gender, age, nationality, residence, academic level, self-reported high school grade-point-average (HS GPA), number of ESL classes enrolled in, and number of academic classes enrolled in. As shown in Table 13, the study sample was comprised

of N =33 students randomly assigned to the experimental group (n = 19) or the control group (n = 14). Overall, approximately three out of four students were male (72.7%), and this ratio remained consistent within the two groups. Similarly, the median age of all the students (median = 22) was consistent within each group, as were the mean HS GPA (3.3), mean number of ESL classes (2.6), and mean number of academic classes (1.6). While the nationality of the students in the experimental and control groups were similar with the proportion of Chinese and Indian students, the proportion of Iraqi and Other students was higher in the experimental group, and the proportion of Saudi students was higher in the control group. Regarding place of residence, 100% of students in the experimental group lived off campus, whereas two-thirds of the students in the control group lived off campus. Finally, approximately 40% of the experimental group were undergraduate students, whereas approximately 40% of the control group were graduate students.

Table 13. *Demographic Characteristics of Sample*

Characteristic	Total (N = 33)		Experimental (n = 19)		Control (n = 14)	
	n	%	n	%	n	%
Total Sample	33	100.0	--	--	--	--
Groups						
Experimental	19	57.6	19	100.0	0	0.0
Control	14	42.4	0	0.0	14	100.0
Gender						
Female	9	27.3	5	26.3	4	28.6
Male	24	72.7	14	73.7	10	71.4
Age						
Mean	21.4	--	21.6	--	21.1	--
Median	22	--	22	--	22	--
Nationality						
China	16	48.5	9	47.4	7	50.0
India	4	12.1	2	10.5	2	14.3
Iraq	2	6.1	2	10.5	0	0.0
Saudi Arabia	6	18.2	1	5.3	5	35.7
Other	5	15.2	5	26.3	0	0.0
Residence						
Off Campus	28	84.9	19	100.0	9	64.3
On Campus	5	15.1	0	0.0	5	35.7
Academic Level						
Undergraduate	17	51.5	8	42.1	9	64.3
Graduate	16	48.5	11	57.9	5	35.7
HSGPA						
Mean	3.3	--	3.3	--	3.3	--
Median	3.3	--	3.3	--	3.2	--
# of ESL Classes						
Mean	2.6	--	2.6	--	2.6	--
Median	3	--	2	--	3	--
# of Academic Classes						
Mean	1.6	--	1.5	--	1.6	--
Median	1	--	1	--	1	--

Note. Frequency and percentages are within column.

TOEFL scores. Table 14 presents the results of descriptive statistics in which the mean and standard deviation (SD) of the TOEFL reading score were examined across group assignment, gender, nationality, residence, and academic level. In general, mean post-course TOEFL scores were higher than mean pre-course TOEFL scores.

Additionally, the distribution of the TOEFL reading score was analyzed for normality using the Kolmogorov-Smirnova (KS) test of normality. Results found all three TOEFL measures violated the assumption of normality: Pre TOEFL KS = 0.201, $p < 0.01$, Post TOEFL KS = 0.307, $p < 0.01$, and Post-Pre TOEFL KS = 0.168, $p < 0.05$. Therefore, inferential statistics testing the significance of the Post-Pre difference in the experimental vs. control groups should include statistical procedures appropriate for non-normal data (i.e., nonparametric statistical procedures).

Table 14. *Descriptive Statistics of TOEFL Reading Score across Demographic Characteristics*

Demographic Characteristic		Pre		Post		Post-Pre	
		M	SD	M	SD	M	SD
Total	Total	50.76	1.87	54.67	1.19	3.91	1.91
Group	Experimental	50.58	2.09	55.05	1.03	4.47	1.87
	Control	51.00	1.57	54.14	1.23	3.14	1.75
Gender	Female	50.89	1.83	55.44	0.88	4.56	1.42
	Male	50.71	1.92	54.38	1.17	3.67	2.04
Nationality	China	50.94	1.57	54.31	1.08	3.38	2.03
	India	50.50	1.73	54.25	1.50	3.75	1.50
	Iraq	53.50	0.71	57.00	0.00	3.50	0.71
	Saudi Arabia	50.67	1.75	54.83	0.41	4.17	1.94
	Other	49.40	2.51	55.00	1.22	5.60	1.52
Residence	Off-Campus	50.54	1.93	54.79	1.17	4.25	1.80
	On-Campus	52.00	0.71	54.00	1.23	2.00	1.41
Academic Level	Undergraduate	51.29	1.53	54.71	0.99	3.41	1.91
	Graduate	50.19	2.07	54.63	1.41	4.44	1.83
Experimental	Female	51.20	1.79	55.80	1.10	4.60	0.89
	Male	50.36	2.21	54.79	0.89	4.43	2.14
	China	50.67	1.73	54.67	0.71	4.00	2.18
	India	50.50	2.12	55.00	0.00	4.50	2.12
	Iraq	53.50	0.71	57.00	0.00	3.50	0.71
	Saudia Arabia	50.00	--	55.00	--	5.00	--
	Other	49.40	2.51	55.00	1.23	5.60	1.52
	Off Campus	50.58	2.09	55.05	1.03	4.47	1.87
	On-Campus	--	--	--	--	--	--
	Undergraduate	51.00	1.60	55.13	0.84	4.13	1.64
Graduate	50.27	2.41	55.00	1.18	4.73	2.05	
Control	Female	50.50	2.08	55.00	0.00	4.50	2.08
	Male	51.20	1.40	53.80	1.32	2.60	1.35
	China	51.29	1.38	53.86	1.35	2.57	1.62
	India	50.50	2.12	53.50	2.12	3.00	0.00
	Iraq	--	--	--	--	--	--
	Saudia Arabia	50.80	1.92	54.80	0.45	4.00	2.12
	Other	--	--	--	--	--	--
	Off Campus	50.44	1.67	54.22	1.30	3.78	1.64
	On-Campus	52.00	0.71	54.00	1.23	2.00	1.41
	Undergraduate	51.56	1.51	54.33	1.00	2.78	1.99
Graduate	50.00	1.23	53.80	1.64	3.80	1.10	

CIS scores. Table 15 presents the results of descriptive statistics in which the mean and standard deviation (SD) of the CIS were examined across group assignment, gender, nationality, residence, and academic level. As shown, the mean CIS full score and the mean of the CIS four factors (attention, relevance, confidence, and satisfaction) were approximately similar between the experimental and control groups. In contrast, mean CIS scores were higher for females than males, higher for Iraqi students, higher off-campus students, and higher for graduate students.

Additionally, the reliability of the CIS scale in the study was evaluated as was the normality of the CIS scores using the Kolmogorov-Smirnova (KS) test of normality. In this study, reliability was evaluated using alpha values ≥ 0.7 as statistical evidence of reliability (Cronbach & Meehl, 1955; Hinkin, 1998). Results found Cronbach's alpha for the CIS was acceptable (alpha = 0.891). The KS test of normality found the CIS did not violate the assumption of normality: KS = 0.075, $p > 0.15$.

Table 15. *Descriptive Statistics of CIS Scores across Demographic Characteristics*

Demographic		CIS Full		Attention		Relevance		Confidence		Satisfaction	
Characteristic		M	SD	M	SD	M	SD	M	SD	M	SD
Total	Total	126.48	15.73	27.00	3.92	34.42	5.65	31.46	3.95	33.61	4.87
Group	Experimental	126.26	17.13	26.79	4.44	34.26	6.74	31.95	4.01	33.26	4.85
	Control	126.79	14.24	27.29	3.22	34.64	3.93	30.79	3.91	34.07	5.05
Gender	Female	131.67	15.44	27.11	4.34	35.22	4.44	33.11	3.72	36.22	4.41
	Male	124.54	15.72	26.96	3.85	34.13	6.10	30.83	3.92	32.63	4.75
Nationality	China	130.25	14.69	28.38	3.93	36.13	5.02	31.56	4.44	34.19	4.43
	India	118.50	20.80	25.25	3.59	31.25	9.74	31.25	2.06	30.75	6.60
	Iraq	137.00	8.49	29.50	6.36	34.50	4.95	36.00	0.00	37.00	2.83
	Saudi Arabia	116.60	19.71	24.40	3.78	32.00	6.44	29.40	4.83	30.80	5.72
	Other	126.50	10.63	25.83	2.32	34.00	3.16	31.50	2.59	35.17	4.02
Residence	Off-Campus	127.43	16.24	27.00	4.25	34.57	5.88	31.93	3.86	33.93	4.85
	On-Campus	121.20	12.64	27.00	1.00	33.60	4.56	28.80	3.70	31.80	5.12
Academic Level	Undergraduate	125.29	11.26	26.77	2.64	34.35	4.39	30.82	3.80	33.35	3.55
	Graduate	127.75	19.73	27.25	5.03	34.50	6.89	32.13	4.11	33.88	6.09
Experimental	Female	131.00	9.70	26.60	2.30	35.00	3.81	33.60	2.79	35.80	3.49
	Male	124.57	19.12	26.86	5.07	34.00	7.63	31.36	4.29	32.36	5.05
	China	132.89	11.25	28.33	4.21	37.11	5.18	32.78	3.77	34.67	2.69
	India	111.50	33.20	24.00	5.66	27.50	14.80	30.00	1.41	30.00	11.31
	Iraq	137.00	8.49	29.50	6.36	34.50	4.95	36.00	0.00	37.00	2.83
	Saudia Arabia	123.00	--	25.00	--	33.00	--	33.00	--	32.00	--
	Other	116.60	19.71	24.40	3.78	32.00	6.44	29.40	4.83	30.80	5.72
	Off Campus	126.26	17.13	26.79	4.44	34.26	6.74	31.95	4.01	33.26	4.85
	On-Campus	--	--	--	--	--	--	--	--	--	--
	Undergraduate	128.25	10.89	27.25	3.33	35.00	4.93	32.25	4.10	33.75	2.49
Graduate	124.82	20.97	26.45	5.24	33.73	8.00	31.73	4.13	32.91	6.14	
Control	Female	132.50	22.50	27.75	6.50	35.50	5.74	32.50	5.07	36.75	5.91
	Male	124.50	10.16	27.10	0.88	34.30	3.30	30.10	3.41	33.00	4.55
	China	126.86	18.62	28.43	3.87	34.86	4.88	30.00	5.03	33.57	6.21
	India	125.50	0.71	26.50	0.71	35.00	2.83	32.50	2.12	31.50	0.71
	Iraq	--	--	--	--	--	--	--	--	--	--
	Saudia Arabia	127.20	11.73	26.00	2.55	34.20	3.49	31.20	2.77	35.80	4.15
	Other	--	--	--	--	--	--	--	--	--	--
	Off Campus	129.89	14.81	27.44	4.03	35.22	3.70	31.89	3.76	35.33	4.82
	On-Campus	121.20	12.64	27.00	1.00	33.60	4.56	28.80	3.70	31.80	5.12
	Undergraduate	122.67	11.55	26.33	1.94	33.78	4.06	29.56	3.21	33.00	4.42
Graduate	134.20	16.89	29.00	4.53	36.20	3.56	33.00	4.42	36.00	6.04	

Inferential Statistics

Post-pre TOEFL score differences. Table 16 presents the results of inferential statistics used for testing the effect of the inferencing strategy on TOEFL reading score. Two inferential statistical tests were used to test the significance of the mean post-pre TOEFL score in the experimental group compare to the control group. As shown, two tests were used: the independent samples *t*-test (for normal data) and the Mann-Whitney *U*-test (for non-normal data). Results of both tests found the post-pre TOEFL score was significantly higher in the experimental group compared to the control group at the 95% level of significance (i.e., $p < 0.05$). Figure 2 shows a plot of the mean post-pre TOEFL score in both groups.

Table 16. *Effect of Inferencing Strategy on TOEFL Reading Score*

Group	Pre-Course TOEFL		Post-Course TOEFL		Post-Pre Difference		<i>t</i>	<i>df</i>	<i>p</i>	<i>U</i>	<i>p</i>
	M	SEM	M	SEM	M	SEM					
Experimental	50.58	0.48	55.05	0.24	4.47	0.43	2.10	29	0.045	76.5	0.036
Control	51.00	0.42	54.14	0.33	3.14	0.47					

Note. Independent samples *t*-test and Mann-Whitney *U*-test conducted on the difference in mean post-pre difference score between experimental and control sections. M = mean, SEM = standard error of the mean.

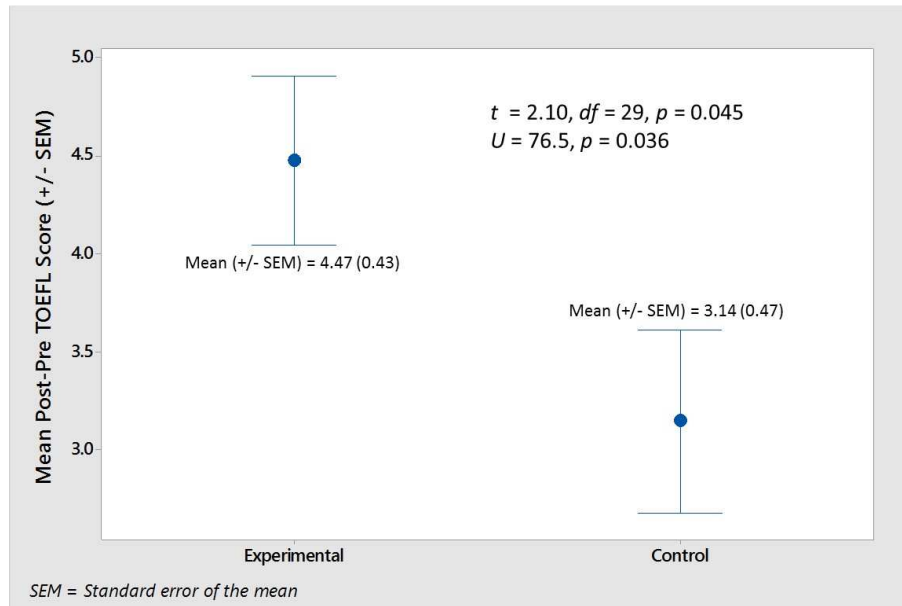


Figure 2. Effect of inferencing strategy on TOEFL reading score.

Table 17 presents the results of inferential statistics comparing the mean post-pre TOEFL score across gender, nationality, residence, and academic level. Because nationality was comprised of more than two groups, the ANOVA *F*-test for normal data and the Kruskal Wallis *H*-test for non-normal data were used as inferential statistical tests. As shown, results found post-pre TOEFL scores were not significantly different between males and females, between nationalities, or between undergraduate and graduates ($p > 0.05$). In contrast, results found post-pre TOEFL scores were significantly higher in off-campus vs. on-campus students. Therefore, a subsequent ANOVA was conducted on the post-pre TOEFL score difference in the experimental vs. control groups after controlling for residence (see Table 18). As shown, the significant effect of inferencing strategy on TOEFL reading score in the experimental group vs. the control group was lost after controlling for residence. However, it should be noted that there were no on-campus students in the experimental group; this may have impacted the results of the ANOVA test of the post-pre TOEFL score difference in the experimental vs. control groups after controlling for residence.

Table 17. *Effect of Inferencing Strategy on TOEFL Reading Score across Demographics*

Demographic Characteristic		Post-Pre				<i>H</i>	<i>P</i>
		M	SD	<i>F</i>	<i>p</i>		
Group	Experimental	4.47	1.87	4.320	0.046	4.397	0.036
	Control	3.14	1.75				
Gender	Female	4.56	1.42	1.437	0.240	2.019	0.155
	Male	3.67	2.04				
Nationality	China	3.38	2.03	1.421	0.253	5.586	0.232
	India	3.75	1.50				
	Iraq	3.50	0.71				
	Saudi Arabia	4.17	1.94				
Residence	Off-Campus	4.25	1.80	6.990	0.013	5.659	0.017
	On-Campus	2.00	1.41				
Academic Level	Undergraduate	3.41	1.91	2.488	0.125	2.049	0.152
	Graduate	4.44	1.83				

Note. One-way ANOVA *F*-test and Kruskal Wallis *H*-test conducted on the difference in mean post-pre difference scores. M = Mean, SD = Standard Deviation.

Table 18. *Effect of Inferencing Strategy on TOEFL Reading Score Controlling for Residence*

Source	<i>df</i>	F	<i>p</i>
Intercept	1	81.067	0.000
Group	1	0.961	0.335
Residence	1	3.302	0.079
Error	30		

Note. General Linear Model *F*-test conducted on the difference in mean post-pre difference scores.

CIS score differences. Tables 19-23 present the results of inferential statistics used for examining student's attitudes and perceptions of the inferencing strategy for reading compared to the current course instruction for reading. Specifically, the ANOVA *F*-test for normal data and the Kruskal Wallis *H*-test for non-normal data were used as inferential statistical tests to compare the mean CIS scores in the experimental vs. the control groups and across gender, nationality, residence, and academic level. As shown in Table 19, there were no significant differences found in the mean CIS full score between groups and across the four demographic characteristics ($p > 0.05$). Similarly, as shown in Tables 19-23, there were no significant differences found in the mean Attention, Relevance, Confidence, and Satisfaction scores between groups and across the four demographic characteristics ($p > 0.05$).

Table 19. *Effect of Inferencing Strategy on Total CIS Score across Demographics*

Demographic Characteristic		CIS				<i>H</i>	<i>P</i>
		M	SD	F	<i>p</i>		
Group	Experimental	126.48	15.73	0.009	0.927	0.319	0.572
	Control	126.26	17.13				
Gender	Female	126.79	14.24	1.358	0.253	0.792	0.374
	Male	131.67	15.44				
Nationality	China	124.54	15.72	1.240	0.317	3.732	0.443
	India	130.25	14.69				
	Iraq	118.50	20.80				
	Saudi Arabia	137.00	8.49				
	Other	116.60	19.71				
Residence	Off-Campus	126.50	10.63	0.658	0.423	1.641	0.200
	On-Campus	127.43	16.24				
Academic Level	Undergraduate	121.20	12.64	0.196	0.661	0.812	0.368
	Graduate	125.29	11.26				

Note. One-way ANOVA *F*-test and Kruskal Wallis *H*-test conducted on the difference in mean post-pre difference scores. M = Mean, SD = Standard Deviation.

Table 20. *Effect of Inferencing Strategy on Attention CIS Score across Demographics*

Demographic Characteristic		Attention				<i>H</i>	<i>P</i>
		M	SD	F	<i>p</i>		
Group	Experimental	27.00	3.92	0.126	0.725	0.599	0.439
	Control	26.79	4.44				
Gender	Female	27.29	3.22	0.010	0.922	0.121	0.728
	Male	27.11	4.34				
Nationality	China	26.96	3.85	1.718	0.174	4.928	0.295
	India	28.38	3.93				
	Iraq	25.25	3.59				
	Saudi Arabia	29.50	6.36				
	Other	24.40	3.78				
Residence	Off-Campus	25.83	2.32	0.000	1.000	0.284	0.594
	On-Campus	27.00	4.25				
Academic Level	Undergraduate	27.00	1.00	0.123	0.728	0.016	0.899
	Graduate	26.77	2.64				

Note. One-way ANOVA *F*-test and Kruskal Wallis *H*-test conducted on the difference in mean post-pre difference scores. M = Mean, SD = Standard Deviation.

Table 21. *Effect of Inferencing Strategy on Relevance CIS Score across Demographics*

Demographic Characteristic		Relevance				<i>H</i>	<i>P</i>
		M	SD	F	<i>p</i>		
Group	Experimental	34.42	5.65	0.035	0.852	0.065	0.798
	Control	34.26	6.74				
Gender	Female	34.64	3.93	0.241	0.627	0.050	0.823
	Male	35.22	4.44				
Nationality	China	34.13	6.10	0.907	0.473	2.559	0.634
	India	36.13	5.02				
	Iraq	31.25	9.74				
	Saudi Arabia	34.50	4.95				
	Other	32.00	6.44				
Residence	Off-Campus	34.00	3.16	0.122	0.729	0.650	0.420
	On-Campus	34.57	5.88				
Academic Level	Undergraduate	33.60	4.56	0.005	0.942	0.497	0.481
	Graduate	34.35	4.39				

Note. One-way ANOVA *F*-test and Kruskal Wallis *H*-test conducted on the difference in mean post-pre difference scores. M = Mean, SD = Standard Deviation.

Table 22. *Effect of Inferencing Strategy on Confidence CIS Score across Demographics*

Demographic Characteristic		Confidence				<i>H</i>	<i>P</i>
		M	SD	F	<i>p</i>		
Group	Experimental	31.46	3.95	0.692	0.412	0.841	0.359
	Control	31.95	4.01				
Gender	Female	30.79	3.91	2.268	0.142	2.087	0.149
	Male	33.11	3.72				
Nationality	China	30.83	3.92	1.010	0.419	4.172	0.383
	India	31.56	4.44				
	Iraq	31.25	2.06				
	Saudi Arabia	36.00	0.00				
	Other	29.40	4.83				
Residence	Off-Campus	31.50	2.59	2.819	0.103	2.617	0.106
	On-Campus	31.93	3.86				
Academic Level	Undergraduate	28.80	3.70	0.894	0.352	0.666	0.414
	Graduate	30.82	3.80				

Note. One-way ANOVA *F*-test and Kruskal Wallis *H*-test conducted on the difference in mean post-pre difference scores. M = Mean, SD = Standard Deviation.

Table 23. *Effect of Inferencing Strategy on Satisfaction CIS Score across Demographics*

Demographic Characteristic		Satisfaction				<i>H</i>	<i>P</i>
		<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>		
Group	Experimental	33.61	4.87	0.216	0.645	0.000	0.985
	Control	33.26	4.85				
Gender	Female	34.07	5.05	3.889	0.058	2.925	0.087
	Male	36.22	4.41				
Nationality	China	32.63	4.75	1.249	0.313	5.289	0.259
	India	34.19	4.43				
	Iraq	30.75	6.60				
	Saudi Arabia	37.00	2.83				
	Other	30.80	5.72				
Residence	Off-Campus	35.17	4.02	0.805	0.377	1.128	0.288
	On-Campus	33.93	4.85				
Academic Level	Undergraduate	31.80	5.12	0.092	0.764	0.119	0.730
	Graduate	33.35	3.55				

Note. One-way ANOVA *F*-test and Kruskal Wallis *H*-test conducted on the difference in mean post-pre difference scores. *M* = Mean, *SD* = Standard Deviation.

Observations

Table 24 presents four researcher observations of the student and instructor behaviors taken at week 1A, week 1B, week 5A, and week 7A. The instruction was explicitly given to the students in order to facilitate knowledge transfer from the instructor to the students. The instructor was motivational in his presentation of the instruction and students were eager to pick up the strategy being taught during their instructional time using fun and interactive activities which provided students with a learning environment that had explicit outcomes. As Table 24 and 25 show some of the activities and instruction I observed during my time in the classroom with these students. Protocol analysis studies how individuals with limited knowledge describe within a certain domain information during instruction (Fonteyn, Kuipers, & Grobe, 1993).

Table 24. *Researcher Observations of Student and Instructor Behaviors*

Observations	Overview
1, Week 1A	The instructor introduced inferencing strategy to students. He used a PowerPoint presentation with many details and examples of inferencing and what it means to infer things. Such as show a picture with a man wearing running cloths and asking students what they could infer from the picture. At first the students were skeptical, however as the instructor used different tools to show them the relevance to the course and to their learning they came on board with him and began to participate in the instructional content. He got their attention really quickly and was able to make the time in the class fun for all the students. He went to show them more examples and they were involved in making the inferences and looking to the instructor for affirmation that they were right.
2, Week 1B	This second observation came on the second day of instruction with the inferencing strategy. Students were asked to come up to the front of the class and each of the students sitting down was to infer something about the student from their appearance. The students had a lot fun and they got to know each other better even though some were wrong in their inferences.
3, Week 5A	I waited a couple of weeks before going back to the classroom for another observation. Students were participating in the instruction intentionally where they would try to infer from different things around them. The researcher was used for inference lesson in this observation. Students were having fun and seemed satisfied with the way they were learning the instruction and participation was higher than before.
4, Week 7A	On this day students did the Two-Minute Mysteries group activity (Sobol, 1967; see Table 25). The activity was interesting and educational. Students appeared to understand and comprehend the use of inferencing strategy.

Table 25. *Two-Minute Mysteries Group Activity*

Title	Mystery (Text given to students)	Conclusion (text not given to students)
Attempted Murder	<p>"Jack Alden's account of the attempted strangling of Mrs. McHenry is pretty farfetched," Inspector Winters told Dr. Haledjian. "Yet he passed a lie detector test. "Alden drives a delivery truck for Best Cleaners," explained the inspector. "At five minutes before noon Tuesday he drove to the McHenry House and stopped the truck in the driveway. "He spent about two minutes filling out his delivery reports for the morning. Then he got out with a dress and two suits. "As he closed the cab door, he noticed his front wheels were parked on the garden hose which ran from an outlet by the garage around to the back of the house. Alden claims he got back into his truck and drove forward a few feet so that his engine was in the McHenry's empty garage. Her he noticed the door between the kitchen and the garage was open. He saw Mrs. McHenry lying on the floor by the stove. "He rushed to her, he says, and was trying to revive her when Mr. McHenry came through the open door of the garage.</p> <p>"McHenry had taken the day off to water his backyard garden. He had been hosing down his flowerbeds and hedges for half an hour when he noticed the truck in his garage. He walked over to investigate. We can't get McHenry," concluded the inspector, "to state definitely whether he thinks Alden was trying to throttle his wife or revive her. No wonder the lie detector test didn't trap Alden!" said Haledjian. Why not?</p>	<p>Because Alden told the truth Haledjian deduced that McHenry, while throttling his wife, had been surprised by the arrival of the deliveryman and had hurried to the backyard and his alibi of hosing the his garden. Had he been there all the time he would have investigated why the water stopped flowing. The truck wheels were parked on the garden hose for "about two minutes," remember.</p>
Dead professor	<p>"I heard a shot as I was sorting the silverware," said Mrs. Grummand, the housekeeper. "When I entered the study, Professor Townsend was li - like that!" Seated at his desk was Reingald Townsend, chair-man of the English Department of Overton Univer-sity. Haledjian studied the position of the body, which had sagged against the left arm of the leather swivel chair. The bullet had entered the right temple. A .38 caliber, double-action 1875 Army revolver lay in Townsend's lap. On the desk was a note apparently signed by Reingald Townsend?. Haledjian read: "After having spoken with Dinker this morning, I have decided not to delay. I do what I must. Not even you, dearest Kay, can know the bottomless despair of being compelled to retire. Too old! To fully understand, one must have taught thirty-five years, as I have. Ahead is nothing. Farewell, I love you." "Who are "Dinker and Kay?" inquired Haledjian. Dinker is Paul Dinkerton, president of the university," replied the housekeeper. "Kay is Mrs. Townsend. She was called out of town suddenly. She left about ten this morning." "Who are Professor Townsend's heirs?" Mrs. Grummond hesitated. "Why, it is generally believed that Mrs. Townsend and I will share equally." "Even if Professor Townsend was murdered?"</p>	<p>The suicide note was an obvious phony. The chairman of the English Department would never have committed two grammatical sins- a redundant phrase and a split infinitive. He would have written, "Having spoken," instead of after having spoken," and "To understand fully," instead of to fully understand."</p>

Table 25. *Continued*

Title	Mystery (Text given to students)	Conclusion (text not given to students)
Death Plunge	<p>While browsing in the Professional Photographers' Exhibition, Dr. Haledjian stopped to admire a striking photograph in the flashgun category entitled "Death Plunge." The print showed a small girl touching a lighted match to a Christmas candle. Beside the candle stood a pile of gifts. The girl was blonde, pug-nosed, and adorable. But what made the photograph spellbinding was the second figure. It was a woman, back to camera, falling past the picture window just behind the little girl. "This remarkable shot was taken August 24 at 9:30 P.M. by Bertram Kennedy in his Brooklyn studio apartment. At the moment Mr. Kennedy took the picture, Mrs. Claire Gramelin was falling from the roof six stories above. Her body, stopped in midair, produced this startling backdrop for what was intended as the Christmas cover of Family Times Magazine. It is believed Mrs. Gramelin, who weighed only ninety pounds, lost her footing in the storm winds which reached forty miles an hour that night. She died. upon striking the sidewalk." Haledjian finished reading as a group of officials moved in his direction. One of the men held a blue ribbon. As he was about to pin it to "Death Plunge," Haledjian spoke up. "I wouldn't do that," cautioned the famed sleuth. "Unless you want to award first prize to an obvious fake!" How did Haledjian know?</p>	<p>The picture window was closed, or else the little girls could not have held a lighted match in winds of forty miles an hour. Therefore the body of the woman could not be seen falling outside. Remember, the shot was snapped at night with a flashgun, making the room brighter than the outdoors; thus, the window would have acted as a mirror, reflecting the room rather than transmitting the figure of Mrs. Gramlin.</p>
Dentist's Patient	<p>Dr. Evelyn Williams, London-born New York dentist, was preparing to take a wax impression of the right lower teeth of his patient, Dorothy Hoover. Silently-the door behind him opened. A gloved hand holding an automatic appeared. Two shots sounded. Miss Hoover slumped over, dead. "We've got a suspect," Inspector Winters told Dr. Haledjian at his office an hour afterward. "The elevator boy took a nervous man to the fifteenth floor -Dr. Williams has one of six offices on the floor a few moments before the shooting. The description fits John 'Torpedo' Burton. "Burton is out on parole," continued the inspector. "I had him picked up at his rooming house. As far as he knows, I want to question him about a minor parole infraction." Burton was ushered in and angrily demanded, "What's this all about?" "Ever hear of Dr. Evelyn Williams?" asked the inspector. "No, why?" "Dorothy Hoover was shot to death less than two hours ago as she sat in a chair in Dr. Williams' office." "I been sleeping all afternoon." "An elevator operator says he took a man answering your description to the fifteenth floor a moment before the shots." "It wasn't me," snarled Burton. "I look like a lot of guys. I ain't been near a dentist's office since Sing Sing. This Williams, I bet he never saw me, so what can you prove?" "Enough," snapped Dr. Haledjian, "to send you to the chair!" What was the basis of Haledjian's remark?</p>	<p>Although Burton claimed never to have heard of a Dr. Evelyn Williams, he new the doctor was 1). A dentist 2). A man.</p>

Summary

In this chapter, I have analyzed all the evidence needed to answer the main research questions. My aim was to determine if the inferencing strategy instruction helped students with their reading comprehension in English throughout the ten weeks of instruction and if this instruction helped them improve their TOEFL test scores to give them admission into the academic program of their choice. Quantitative and qualitative data was collected to examine whether students using the inferencing strategy improved their test scores compared to students not specifically using the same strategy directly and explicitly. The purpose of this chapter was to present the results of the data collected from both the control group and the experimental group. The next chapter consists of a discussion of the results.

CHAPTER 5—DISCUSSION

Introduction

The purpose of this research study was to examine the impact of an inferencing reading strategy on TOEFL reading comprehension scores in English as a Second Language (ESL) students taking a level 4 reading course at Lawrence Technological University in Michigan, U.S. To meet this purpose, an inferencing reading strategy was implemented over 10 weeks of instruction. A quasi-experimental study was conducted in which the difference in pre- and post-course TOEFL reading section scores was examined in ESL students in the experimental group compared to ESL students in the control group. Both groups of students also completed a demographic survey and the Course Interest Survey (CIS) of student perceptions to answer the following research questions:

1. What are the characteristics of a new inferencing strategy for learning reading comprehension in ESL students?
2. What is the impact of the new inferencing strategy on ESL students' reading comprehension?
3. What are students' attitudes and perception of the course materials and delivery of the new inferencing strategy?
4. Are there any recommended changes to the new inferencing strategy to increase ESL student's reading comprehension?

This chapter presents the rationale and significance of study, discussion of study results, implications of study for teaching ESL, study limitations, and recommendations for future research.

Discussion of Study Results

This study aimed to answer four research questions. The first research question asked: What are the characteristics of a new inferencing strategy for learning reading comprehension in ESL students? According to Lynette (2012) inference is using facts, observations, and logic or reasoning to come to an assumption or conclusion. It is not stating the obvious (stating the obvious: a woman is wearing a white dress, inference: the woman is a bride). It is not prediction, though the two are definitely related. Remind students that inference asks, ‘what conclusions can you draw about what is happening now?’ Prediction asks, ‘What will happen next?’ (p. 1) According to the International Baccalaureate Program, inferencing is defined as the ability to deduce and reason from premises to a conclusion, and listen or read beyond what has been literally expressed (Hill, 2007). Inferencing is the ability to create a thought or opinion that can be supported by the text. Oftentimes, it requires combining one’s background knowledge and life experience with the text-based evidence. Inferencing can be a difficult reading strategy to teach, which is a bit ironic since most of us are constantly inferring things about the world around us and have been since a fairly young age (Marzano, 2010). The trick is to help students learn how to do inferencing with text (Huynh, 2016).

To answer the first study research questions, I designed an inferencing strategy curriculum and coached the course instructor on delivering it to a sample of 19 ESL students in the experimental group. The full 10-week course is described in Table 9, additionally I observed four class sessions during the ten week study to help describe the elements of the inferencing strategy and how they were delivered (see Tables 23 and 24). During the first class observation, students were skeptical of learning the inferencing strategy. I observed one student saying “nothing helps pass the placement reading exam. It’s just too hard for non-native English speakers to pass.”

However, as the class progressed over the ten weeks I saw positive participation in the sessions and the inferencing strategy activities. The course instructor gave positive feedback and encouragement to motivate student participation. The following observations of an inferencing strategy activity clarifies the activities of the inferencing strategy:

“Scott had an overhead picture of a man wearing running clothes with a number taped on his back. He proceeded to ask students to make inferences from the picture based on the clothing the man was wearing. Students had to write down their answers and later read them a loud to the class. Research suggests that language can grow from engaging in tasks that require higher-order thinking, and ESL students, despite their language status, can still think critically (Himmele & Himmele, 2009). Another activity observed in this class was solving a murder mystery (Table 24). Scott organized the students into groups of four or five students, and each group was given a one-page mystery from a book called ‘Two-Minute Mysteries’ (Sobol, 1967). The objective of this activity s for students to infer the mystery based on limited text and somewhat ambiguous clues. As shown in Table 24, students read and made inferences on four mysteries given in class. Students had ten minutes to read the text and discuss in their group what can be inferred from the text. Students were instructed to find clues, generate answers, and add those clues to what they already knew. After their group discussions the groups displayed the clues and their conclusions from the text given to them by the instructor using chart paper. Students were able to explore the genre of mysteries as a class. Student came up with different answers as to who the killer was in each case.

Mysteries provide an excellent opportunity for students to infer because they can usually be solved with more than one correct answer. Regardless of the answer, students need to support their conclusions with information they already were given (Marzano, 2010). Marzano (2010) suggests teachers pose four questions to students to facilitate a discussion about inferences.

1. What is my inference? This question helps students become aware that they may have just made an inference by filling in information that wasn't directly presented. This question helps students create information from the inference which in turn gives the student confidence in their ability to come up with an answer.
2. What information did I use to make this inference? It's important for students to understand the various types of information they use to make inferences. This may include information presented in the text, or it may be background knowledge that a student brings to the learning setting.
3. How good was my thinking? According to Marzano (2010), once students have identified the premises on which they've based their inferences, they can engage in the most powerful part of the process — examining the validity of their thinking.
4. Do I need to change my thinking? The final step in the process is for students to consider possible changes in their thinking. The point here is not to invalidate students' original inferences, but rather to help them develop the habit of continually updating their thinking as they gather new information.

The second research question asked, what is the impact of the new inferencing strategy on ESL students' reading comprehension? As shown in Table 15 and Figure 2, students in the inferencing strategy group had significantly higher Post-Pre TOEFL reading scores than students in the current course. Specifically, the mean (SD) Post-Pre TOEFL score difference in experimental students = 4.47 (1.87), and in control students = 3.14 (1.75). This difference was significantly higher in experimental students than control students (at the 95% level of significance, $p < 0.05$). These results suggest the inferencing strategy was more effective in teaching reading comprehension in ESL students than the current reading comprehension instruction. From this finding it can be

inferred that the inferencing strategy might improve the overall reading comprehension of ESL students. Additionally, results found the Post-Pre TOEFL score did not differ across gender, nationality

Research question three asked, what are students' attitudes and perception of the course materials and delivery of the new inferencing strategy? In order to understand student attitudes and perceptions of the inferencing strategy students in the experimental inferencing strategy group and the control current instruction group completed the CIS at the end of the course. The CIS was designed as a situation specific indirect measure of students' motivation for certain learning settings by measuring students' reactions to instructor-led instruction (Keller, 2010). Results of inferential statistics testing the difference in CIS scores between the experimental and control groups found no significant difference in the CIS full score or any of the four CIS factors: Attention, Relevance, Confidence, and Satisfaction. These results suggest the significant positive impact of the inferencing strategy on TOEFL reading scores is not likely due to students' preference for the inferencing strategy over the current course instruction for reading.

Research question three was also answered by observing students in the inferencing strategy class. My observations told me students in the experimental group were initially skeptical and somewhat apprehensive about the new inferencing strategy and that it would make a difference in the learning process. But I observed Scott working towards creating a motivational environment in which students felt motivated to learn by helping them understand what will be expected and how they will be assessed on those expectations. By explaining things in simple yet concise and explicit terms, students appeared to have confidence in themselves which did not exist before. The objective of this course was for students is to improve their reading comprehension in English so

that they can take a placement test which enable them to matriculate into an American university of their choice. My observations support Keller (2010) observation on,


“motivation is influenced by the degree to which a teacher and the instructional material provide a curiosity arousing and personally relevant set of stimuli together which challenge levels that encourage feelings of confidence and whether there is an absence of the kinds of stressors that inhibit effort. Similarly, the instructional characteristics of the learning materials such as clear objectives and explanations combined with examples and learning activities will influence performance” (p. 6).

Specifically, I worked with Scott to implement activities for the experimental group where the inferencing strategy was the focal point in each activities. After the completion of the instructional material for each class session, a thirty minute chunk of class was dedicated to the inferencing strategy each day of the class, twice a week for ten weeks. The thirty minute chunks helped students explicitly learn about and use the inferencing strategy in reading text. Inferencing is a complicated mental move that requires close reading of the details and connecting them in a way that supports the ESL students’ opinion and claims (Huynh, 2016).

The fourth research question asked: Are there any recommended changes to the new inferencing strategy to increase ESL student’s reading comprehension? After reviewing the study results and my observations I concluded that the inferencing strategy as designed was more effective than the current course instruction in teaching reading comprehension. Therefore, ESL instructors should model inferencing for reading comprehension over and over again, using as many real-life examples as possible, and recognize that the background knowledge upon which inferences are made will be different for each student. ESL instructions should reassure students that inferences can and should be different across students, and that inferences should be made

based on information collected from the text they are reading. Nevertheless, Table 25 presents recommendations for improving the inferencing strategy based on the results of this study. As shown in Table 25, the existing activity is presented as well as recommendations for future activities and comments to augment the existing activities for inferencing. All instructional learning is important to an ESL student in their journey to acquire the language. It is the need to make meaning that is at the heart of acquiring a new language. “As students continue to make and negotiate meaning through relevant interactions and activities, language is acquired at an increasingly higher levels. The goal, then, for students receiving English language development is that they be able to use language to communicate effectively and appropriately for all life’s requirements, both social and academic” (Walter, 2004, p. 16). I am not saying instructors should just use the inferencing strategy alone to instruct their students, perhaps make it one of the main strategies used during the semester. Walter (2004) suggests that it is not enough to be able to read, write and understand basic English students have to have language competence in a variety of areas to succeed academically.

Table 26.. *Instructional Content from Study with some Improvements*

Week	Activity	Recommendations for future instruction
Week 1	Have a student stand in front of the class and ask what the rest of the students could tell about him or her, just by looking. For example, his eyesight is not very good (he is wearing glasses). He likes the Tigers (he is wearing a Detroit Tigers T-shirt). He walked in some mud on his way to school (there is some mud caked on his shoes).	Define Inferencing to students. Find ways to show how we infer all the time. Clearly tie objectives to the class with the instructional material. Make sure the students understand the relationship between instructional materials and objectives. Get their attention. Instructor should have at least five pictures of different things they can use for this activity.
Week 2	 <p>Instructor: Students asked what they can infer from this picture. Student answers:</p> <ul style="list-style-type: none"> -Olympic Logo on his shirt -He is from Ethiopia -He is a runner -He is at the Olympics -He is in Rio Brazil at the 2016 Summer Olympics 	One simplified model (Marzano, <i>The Art and Science of Teaching / Teaching Inference</i> , 2010) for teaching inference includes the following assumptions to address: <ul style="list-style-type: none"> -Find clues to get some answers. -Add those clues to what we already know or have read. -There can be more than one correct answer. -Support inferences. -This activity builds students attention, relevance, confidence and satisfaction
Week 3	Make inferences to understand someone's character what that character means. Select reading materials relevant to this activity	Example of characters: Mean, Bully, Kind, and Angry. Etc. Students start to build their confidence once they are able to critically infer information from reading certain text.
Week 4	Reading text that help with understanding different characters. Students play act certain characters from the readings.	Students were taught to always keep these statements in mind when working on inference activities: <ul style="list-style-type: none"> -Find clues to get some answers. -Add those clues to what we already know or have read. -There can be more than one correct answer. -Support inferences. -students confidence is built by practicing in front of the class and instructor feedback builds satisfaction.

Week	Activity	Recommendations for future instruction
Week 5	Students practiced creating inferences as well as identifying them by issuing a challenge	<p>Some examples of challenges are:</p> <ul style="list-style-type: none"> -Create a character who is very smart without actually saying he or she is smart. -Write about a very cold afternoon without saying that it is cold. -Write about an old car without saying that it is old. -Write about somewhere that is scary without saying that it is a scary place.
Week 6	Separated students into four groups and assigned each group a mystery from the book. They had ten minutes to read the mystery and solve it from the information given. Students came up with a list of the facts and inferences from the text that helped them solve the mystery.	<p>Coming up with inferences is like solving a puzzle or a mystery. Two-minute Mysteries' by Donald J. Sobel can be beneficial to students learning process. Try reading one to the class as a warm-up.</p> <p>Students in their groups read the mystery and solve it based on the inferred clues. As they present their conclusions of the mystery the instructor can orally verify if they were right in their conclusions.</p>
Week 7	Read short text and infer what the author's purpose for writing the text.	<p>Reiteration of prior knowledge acquisition for students was important due to them know what they need to know when they read the text. Asking the right questions. Since inferencing is a complicated mental move that requires close reading of the details and connecting them in a way that supports ESL students opinions and claims from their prior knowledge to establish new knowledge by inferring what is or will happen from the text they read (Huynh, 2016)</p>
Week 8	Iteration of past activities	Instructor
Week 9	Iteration of past activities	<p>Student did another set of Two-Minute Mysteries (Sobol, 1967) using different mysteries from the book and this time the students in each group had to have the whole class help as they presented their mystery with the clues from the reading by using the instruction taught to them during the last eight</p>

		weeks of instruction and practice. By asking the right questions instructors can be assured their students will be able to critically evaluate the text for assumptions based on facts from the text or prior knowledge the students has from his or her own experiences.
Week 10	Posttest and Course Interest Survey	Students complete the TOEFL test and take the Course Interest Survey. Last day of class students are invited to participate in a potluck showcasing their home countries cuisine. This activity can will provide students with the opportunity to meet and reflect their classmate on the course.

Implications of Study for Teaching ESL

This study aimed to determine the effect of an inferencing reading strategy on ESL reading comprehension proficiency. Study results support the efficacy of the inferencing strategy for teaching reading comprehension in ESL students. Research suggests skilled students use a variety of reading strategies with regularity, whereas unskilled students use few strategies and use them less often (Mokhtari & Sheorey, 2002). The current study adds to this body of research because instructors need adequate tools and strategies for teaching ESL students reading comprehension. My study revealed that students in Level four reading taught using inferencing strategy had greater gains in TOEFL reading scores post-course compared to students taught with the current course instruction method (i.e., the course text). These results suggest ESL instructors should utilize an explicit process for teaching reading strategies such as inferencing to ESL students to improve their English linguistic skills.

Results of this study suggest the inferencing strategy transcends student demographic characteristics such as gender and nationality. However, students' diversity implies student

differences. Therefore, ESL instructors should aim to increase student motivation to participate in course inferencing activities. For example, instructor use of motivational feedback on assignments is especially helpful in providing ESL students with information on what they did right and what they need to work on to improve reading via inferencing reading strategy. The use of a learning management technology, such as Blackboard or Canvas, can help ESL instructors provide students with rapid detailed feedback on completed assignments. In other words, ESL instructors should be prepared in advance to combine learning and motivation to help students acquire English fluency. Table 27 presents ten specific questions instructors should consider to create effective learning environments that motivate student engagement. Table 28 presents a summary of instruction designed to motivate student engagement in learning.

Table 27. *Questions for Creating Motivating Learning Environments*

1. What will I do to establish and communicate learning goals, track student progress, and celebrate success?
2. What will I do to help students effectively interact with new knowledge of the inferencing strategy?
3. What will I do to help students practice and deepen their understanding of the inferencing strategy?
4. What will I do to help students generate and their knowledge of the inferencing strategy?
5. What will I do to engage students in participating by grabbing their attention, communicating relevance to their goals, creating confidence in their ability to learn, and providing satisfaction with a positive assessment of their knowledge?
6. What will I do to establish or maintain classroom rules and procedures?
8. What will I do to establish and maintain effective relationships with students?
9. What will I do to communicate high expectations for all students?
10. What will I do to develop effective lessons organized into a cohesive unit?

Note. Adapted from Marzano (2007).

Table 28. *Steps for Teaching Motivation*

Strategy Design	Motivational Design	Instructional Design Steps
Analyze	<ol style="list-style-type: none"> 1. Obtain course information from research study on inferencing strategy 2. Obtain student information from class observations 3. Analyze data from student observations 4. Analyze existing information to tweak in coming semesters for improved instruction 	<ol style="list-style-type: none"> 1. Identify any problem the students might have as a direct result of the instruction and implement instruction as an appropriate solution 2. Identify instructional goals for the class at the beginning of the semester and at each individual lesson for students. 3. Identify entry behaviors and characteristics of students so that individual lessons can be created based on student cultural and background makeup 4. Always conduct instructional analysis to improve and change instruction based on what's working and what's not working
Design	<ol style="list-style-type: none"> 5. List objectives and assessments for students from the beginning so that all expectations are known early on with no surprises. 6. Explicitly and directly inform students of all instructional materials to be used in the class at every opportunity. 7. Select and design all instructional material early and before students are in class for clarity and articulation. 8. Integrate with the instructional materials the background data on students so that instruction is personalized to student's prior knowledge and culture since classes are made up of diverse student bodies. 	<ol style="list-style-type: none"> 5. Write clear objectives that students understand and connect to strategy use in the classroom 6. Develop tests that are connected to the actual strategy used during the instruction. 7. Develop instructional strategy for direct or explicit use in the ESL classroom is of great importance to the students' knowledge base as they will carry is on into all their academic and ESL classes.
Develop	<ol style="list-style-type: none"> 9. Select and develop materials 	<ol style="list-style-type: none"> 10. Develop and select instruction using known strategies like inferencing strategy to use for all instructional material
Study	<ol style="list-style-type: none"> 10. Always evaluate and redesign based on new knowledge acquired during the previous semester. 	<ol style="list-style-type: none"> 11. Design and conduct formative evaluation from current students 12. Design and conduct summative evaluation from data collected during the semester 13. After completing all data collection revise instruction to meet needs of students entering the program.

Note. Adapted from Keller (2010).

Implications to the field of Learning Design and Technology

The field of Learning, Design and Technology impacts my study in several ways. This study aimed to determine whether the inferencing reading strategy helped students in level 4 Reading improve their reading comprehension skills. The study showed that ESL students improved their reading comprehension skills when they intentionally used the inferencing strategy in their learning process. These results suggest that using a certain strategies during the learning process will help students improve their skills. Instructors should implement learning strategies such as inferencing into their curriculum because such a content provides ESL students with opportunities to expand their linguistic development via meaningful interaction with their teacher and their classmates. Another impact on the field comes from motivational design. ESL course content should be designed using motivational strategies using methodology to help give ESL students the needed push to accomplish their educational goals. Finally, designers of ESL instruction are always looking for ways to improve our students' outcomes through continuous improvement by designing effective strategies, testing these strategies and implementing them through activity based instruction with an emphasis on motivational strategies.

Assumptions

Based on my experience with ESL students, there are three assumptions that impacted the study. First, I am assuming all students have the tools needed such as hardware, i.e. computers, to successfully complete the course. The second assumption is that students' reading comprehension skills will improve based on the interventions throughout the semester. Finally, the third assumption is that students will attend all twenty classes during the ten week study.

Rationale and Significance of Study

The rationale for this study came from the researcher's quest to use specific interventions to help ESL students improve their reading comprehension skills so that these students can accomplish their academic goals in American universities. The literature on ESL education suggests there is a gap in learning strategies to improve reading comprehension in ESL students. This study is significant because it found an inferencing learning strategy for reading comprehension was significantly more effective than the current course instruction used at Lawrence Tech for teaching reading comprehension to ESL students. This study is beneficial to all ESL instructors in the U.S. because annually, there are over one million international students that come to the U.S. to earn a university degree and these students must read English effectively in order to adequately complete their academic studies and earn their degree. The significance to this study is to examine the current process of teaching reading to international students and try to implement new instruction using inferencing strategy to improve reading comprehension and TOEFL scores. Study results proved to be beneficial for the ESL program.

Limitations of Study

There were some study limitations observed. The first study limitation was that this study obtained data from a small private university in South East Michigan. Another limitation was the due to low enrollment in the fall of 2017 I had a very small class sizes.

Recommendations for Future Research

Several recommendations should be considered for future research. First, this study relied on post-pre course differences in TOEFL scores as indication of the effects of the inferencing strategy. Future research should study ESL students' reading longitudinal to confirm any short-term improvements in reading comprehension are maintained over time. Second, future research

should combine qualitative data with quantitative data to gain a more complete picture of the effects and perceptions of the inferencing strategy. Third, future research should compare the inferencing strategy with a different explicit strategy for reading comprehension. Fourth, future research should investigate reading fluency in a large sample of ESL students from private and public universities. Fifth, future research should investigate the effects of the length of the course (i.e., this study was conducted with ESL students who were enrolled in a 10-week course). Maybe shorter or longer courses may have different outcomes on TOEFL reading score.

Summary

This study examined the positive effect on reading comprehension of an inferencing strategy for teaching reading. A sample of 19 ESL students completed a ten-week course that utilized inferencing strategy for teaching reading comprehension skills. TOEFL reading scores in the inferencing strategy students were compared to TOEFL reading scores in 14 ESL students who completed a ten-week course that utilized the current university course instruction for teaching reading. Study results found the inferencing strategy was more effective than the current instruction, independent of student demographic characteristics, student attitudes and perceptions of the course in terms attention, relevance, confidence, and satisfaction. Study results supported previous research by Bandura (1986) that using appropriate strategies for learning helps students with self-direction and motivation to learn, two characteristics important for teaching reading comprehension in ESL students.

APPENDIX A: DEPARTMENT APPROVAL



January 1, 2017

Dear Ms. Abbas

I am writing to offer the support of the College of Arts and Science to your research proposal entitled "Inferencing Reading Strategy used to improve reading comprehension and TOEFL test scores of Adult ESL students". We have been working towards increasing retention in our ESL Institute, and are pleased that you want to work with some of our students. We are pleased that your research will help our students improve their English proficiency.

We understand that this proposal requires the support and cooperation of LTU ESL Institute and the Bridge Program. This includes 1) the identification of 2 sections in Level 4 Reading course 2) the identification of at least 2 courses during the Summer of 2017 semester that will incorporate the use of the intervention process in the course content for the experimental group and 3) the collection of data from the students in these identified courses at various points in time throughout the intervention. We are willing to cooperate with this project as long as our policies and rules are followed and our expectations in a number of areas are met. This includes the following:

- That faculty whose courses are part of the intervention are participating voluntarily and will provide the PI time during class in order to administer the surveys and TEOFL test up to three times during the course of the semester.
- That students who volunteer to participate in the study have reduced burden and can change their mind and leave the study at any time during the semester without impact to their grade. They are free to not answer any questions and may withdraw at any time.
- That the results of the research be shared with the with the College of Arts and Science executive team on an on-going basis and in a timely manner
- That the study design/protocol be reviewed and approved by the IRB at Lawrence Tech University.

We support this research and look forward to working with you on this unique and worthwhile project. Please contact me at 248-204-3520 or jbarrett@ltu.edu with any questions.

Sincerely,

Dr. Jason M. Barrett, Chair
Humanities Department

Lawrence Technological University

College of Architecture and Design | College of Arts and Sciences | College of Engineering | College of Management
21000 West Ten Mile Road, Southfield, MI 48075-1058 | 248.204.4000 p | 248.204.3727 f | ltu.edu

APPENDIX B: IRB APPROVAL



Institutional Review Board
Office of the Provost
research.ltu.edu irb@ltu.edu

March 30, 2017

Nawal Abbas, Doctoral Student in WSU College of Education
nabbas@ltu.edu

Dear Ms. Abbas,

I am pleased to report that the IRB application to conduct research with human participants for your research project "Inferencing Reading Strategy Used to Improve Reading Comprehension and TOEFL Test Scores of Adult ESL Students" has been approved under the expedited review path for a period of one year, March 30, 2017 – March 30, 2018. IRB Approval #00517.

The IRB is satisfied that the following ethical concerns regarding the treatment of your human participants have been addressed in your research protocol: (1) The research involves obtaining self-report data from research participants who will voluntarily consent to participate in the study; (2) The research involves delivering the existing ESL pedagogy used at Lawrence Tech with an enhanced component to the research participants who will voluntarily consent to participate in the study and who are free to withdraw from the study at any time without consequences; (3) You have received permission from appropriate authors of any copyrighted survey tools, and/or you are using original survey tools, and/or you are using survey tools in the public domain; (4) You have identified potential risks to you and the participants; and (5) You have assured that a balance exists between potential benefits of the research to the participants and/or society and the risk assumed by the participants.

Please contact the IRB if you require an extension to your project after one year. Please note you must contact the IRB if you make a change to your research protocol that impacts the ethical treatment of your research participants. Please do not hesitate to contact the IRB if you have any questions.

Sincerely,

Matthew Cole, Ph.D.
Chair, Institutional Review Board (IRB)
Lawrence Technological University
irb@ltu.edu o: 248.204.3096 f: 248.204.3099

The Lawrence Tech IRB is organized and operated according to guidelines of the United States Office for Human Research Protections and the United States Code of Federal Regulations and operates under Federal Wide Assurance No. FWA00010997 that expires 02/23/2021.

Lawrence Technological University

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APPENDIX C: INFORMED CONSENT

Research Informed Consent

Inferencing Reading Strategy used to improve reading comprehension of Adult ESL students.

Principal Investigator (PI): Nawal Abbas
Instructional Technology
313-213-6999

Purpose

As an ESL student at Lawrence Tech University you are requested to participate in this research study which will strategy use in the classroom and its effectiveness on your reading comprehension skills. The estimated number of study participants to be enrolled at Lawrence Technological University is about 40 students.

Please read this form and ask any questions you may have before agreeing to be in the study. The purpose of this study is to design and implement one instructional strategy to students in Advanced Intensive Reading course in the ESL program with the goal of increasing student knowledge and achievement of the required 550 score on the TOEFL exam. This strategy may help instructors' instructional experiences supporting students in becoming proficient in English.

Study Procedure

If you agree to take part in this research study, you will be asked to provide consent to;
To complete pretest (TOEFL test),
To complete CIS at the end of the course
To complete a Posttest at the conclusion of the course (TOEFL test)
To agree to participate in all instructional activities and assignment given during the 10 week course schedule.

Benefits

As a participant in this research study, there will be no direct benefit for you; however, information from this study may benefit other people now or in the future.

Risks

There are no known risks at this time to participation in this study.

Study Costs

Participation in this study will be of no cost to you.

Compensation

You will not be paid for taking part in this study.

Confidentiality

All information collected about you during the course of this study will be kept confidential to the extent permitted by law. You will be identified in the research records by a code name or number. Information

that identifies you personally will not be released without your written permission. However, the study sponsor, the Institutional Review Board (IRB) at Wayne State University, or federal agencies with appropriate regulatory oversight [e.g., Food and Drug Administration (FDA), Office for Human Research Protections (OHRP), Office of Civil Rights (OCR), etc.] may review your records.

When the results of this research are published or discussed in conferences, no information will be included that would reveal your identity.

Voluntary Participation/Withdrawal

Taking part in this study is voluntary. You have the right to choose not to take part in this study. If you decide to take part in the study you can later change your mind and withdraw from the study. You are free to only answer questions that you want to answer. You are free to withdraw from participation in this study at any time. Your decisions will not change any present or future relationship with Wayne State University or its affiliates, or other services you are entitled to receive.

The PI may stop your participation in this study without your consent. The PI will make the decision and let you know if it is not possible for you to continue. The decision that is made is to protect your health and safety, or because you did not follow the instructions to take part in the study

Questions

If you have any questions about this study now or in the future, you may contact Nawal Abbas. If you have questions or concerns about your rights as a research participant, the Chair of the Institutional Review Board can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call the Wayne State Research Subject Advocate at (313) 577-1628 to discuss problems, obtain information, or offer input.

Consent to Participate in a Research Study

To voluntarily agree to take part in this study, you must sign on the line below. If you choose to take part in this study you may withdraw at any time. You are not giving up any of your legal rights by signing this form. Your signature below indicates that you have read, or had read to you, this entire consent form, including the risks and benefits, and have had all of your questions answered. You will be given a copy of this consent form.

Signature of participant / Legally authorized representative *

Date

Printed name of participant / Legally authorized representative *

Time

Signature of witness**

Date

Printed of witness**

Time

Signature of person obtaining consent

Date

Printed name of person obtaining consent

Time

APPENDIX D: COURSE INTEREST SURVEY (CIS)

There are 34 statements in this Questioner. Please think about each statement in relation to the class you have just completed and indicate how true it is. Please, give the answer that truly applies to you right now not what you the answer should be or what others think it should be. Think about each statement by itself and indicate how true it is. Do not be influenced by your answers to other statements.

1. The instructor knows how to make us feel enthusiastic about the subject matter of this course.
Not True Slightly True Moderately True Mostly True Very True
2. The things I am learning in this course will be useful to me.
Not True Slightly True Moderately True Mostly True Very True
3. I feel confident that I will do well in this course.
Not True Slightly True Moderately True Mostly True Very True
4. This class has very little in it that captures my attention.
Not True Slightly True Moderately True Mostly True Very True
5. The instructor makes the subject matter of this course seem important.
Not True Slightly True Moderately True Mostly True Very True
6. You have to be lucky to get good grades in this course.
Not True Slightly True Moderately True Mostly True Very True
7. I have to work too hard to succeed in this course.
Not True Slightly True Moderately True Mostly True Very True
8. I do NOT see how the content of this course relates to anything I already know.
Not True Slightly True Moderately True Mostly True Very True
9. Whether or not I succeed in this course is up to me.
Not True Slightly True Moderately True Mostly True Very True
10. The instructor creates suspense when building up to a point.
Not True Slightly True Moderately True Mostly True Very True
11. The subject matter of this course is just too difficult for me.
Not True Slightly True Moderately True Mostly True Very True
12. I feel that this course gives me a lot of satisfaction.
Not True Slightly True Moderately True Mostly True Very True

13. In this class, I try to set and achieve high standards of excellence.
 Not True Slightly True Moderately True Mostly True Very True
14. I feel that the grades or other recognition I receive are fair compared to other students.
 Not True Slightly True Moderately True Mostly True Very True
15. The students in this class seem curious about the subject matter.
 Not True Slightly True Moderately True Mostly True Very True
16. I enjoy working for this course.
 Not True Slightly True Moderately True Mostly True Very True
17. It is difficult to predict what grade the instructor will give my assignments.
 Not True Slightly True Moderately True Mostly True Very True
18. I am pleased with the instructor's evaluations of my work compared to how well I think I have done.
 Not True Slightly True Moderately True Mostly True Very True
19. I feel satisfied with what I am getting from this course.
 Not True Slightly True Moderately True Mostly True Very True
20. The content of this course relates to my expectations and goals.
 Not True Slightly True Moderately True Mostly True Very True
21. The instructor does unusual or surprising things that are interesting.
 Not True Slightly True Moderately True Mostly True Very True
22. The students actively participate in this class.
 Not True Slightly True Moderately True Mostly True Very True
23. To accomplish my goals, it is important that I do well in this course.
 Not True Slightly True Moderately True Mostly True Very True
24. The instructor uses an interesting variety of teaching techniques.
 Not True Slightly True Moderately True Mostly True Very True
25. I do NOT think I will benefit much from this course.
 Not True Slightly True Moderately True Mostly True Very True
26. I often daydream while in this class.
 Not True Slightly True Moderately True Mostly True Very True
27. As I am taking this class, I believe that I can succeed if I try hard enough.
 Not True Slightly True Moderately True Mostly True Very True

28. The personal benefits of this course are clear to me.
 Not True Slightly True Moderately True Mostly True Very True
29. My curiosity is often stimulated by the questions asked or the problems given on the subject matter in this class.
 Not True Slightly True Moderately True Mostly True Very True
30. I find the challenge level in this course to be about right: neither too easy not too hard.
 Not True Slightly True Moderately True Mostly True Very True
31. I feel rather disappointed with this course.
 Not True Slightly True Moderately True Mostly True Very True
32. I feel that I get enough recognition of my work in this course by means of grades, comments, or other feedback.
 Not True Slightly True Moderately True Mostly True Very True
33. The amount of work I have to do is appropriate for this type of course.
 Not True Slightly True Moderately True Mostly True Very True
34. I get enough feedback to know how well I am doing.
 Not True Slightly True Moderately True Mostly True Very True

APPENDIX E: DEMOGRAPHIC CHARACTERISTICS

There are 8 questions in this survey. Choose the answer that best represents your current living situation.

1. What is your age? (Choose one)
18
19
20
21
22+
2. What is your gender? (Choose one)
Male
Female
Other
3. What country are you from?
Saudi Arabia
India
China
Syria
Twain
Other
4. Do you live at the LTU campus or off?
On campus
Off campus
5. What is your academic program at LTU?
BA
Master
Other
6. What was your High school GPA? _____
7. How many ESL courses are you taking this term? _____
8. How many academic courses are you taking this term? _____

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ABSTRACT**INFERCING READING STRATEGY USED TO IMPROVE READING
COMPREHENSION OF ADULT ESL STUDENTS**

by

NAWAL AZAR**August 2018****Advisor:** Dr. Monica Tracey**Major:** Learning Design and Technology**Degree:** Doctor of Philosophy

This dissertation examined the effects of the inferencing reading strategy using a emotionally charged instruction for students from countries who do not speak English as their first language. A quasi-experimental study applying quantitative research methods to collect data from the two sections of Level four Reading classes during a ten week period in the fall of 2017. There was one session of instructor coaching which lasted for four hours, a shared google document and several hours of telephone conversations. Lastly, the research observed four class sessions for the experimental group only. Students completed a pretest and a demographic survey in the first week of class in both the experimental group and the control group. The two section continued on with the experimental group being directly and explicitly being instructed on the inferencing strategy. In the tenth week of class both groups were given posttest and a Course Interest Survey.

The sample for this study were both graduate and undergraduate international students who English was not their first language at Lawrence Tech University. Students in the control group were taught the class the exact way it has been taught for several years using the lesson plans

designed by the teachers and publishers of the books used in the class. However, for the experimental group the same plan was used except for the last thirty minutes of class the instructor incorporated the inferencing strategy as content and used motivational strategy design to motivate students to learn and use what they learned to improve their placement scores.

Findings from the study showed that students in the experimental group did improve over the control group. The quantitative data showed a significance in the posttest as compared to the pretest in the experimental group and at the same time when comparing both groups' posttests there was an improvement in the experimental group over the control group.

AUTOBIOGRAPHICAL STATEMENT

Nawal Abbas has an interesting educational and professional background which began in 2000 when she received a Bachelor of Business Administration from Wayne State University. After working at DTE Energy for several years she decided to transfer her career goal to academia and started working at Davenport University where she got a Master's in Business Administration with a concentration in Global Business. Soon after graduation she moved to Lawrence Technological University where she attained the position of directing the English as a Second Language Program since 2009. A career changing move which paved the way for pursuing the PhD program in Learning Design and Technology from Wayne State University. This move was a result of the work at LTU to improve the ESL program at the same time create an environment where curriculum design was seen as instrumental in instruction for students needing to succeed at learning a second language in a short period of time.

This study showed that with more research in this area and a larger sample size researchers might be able to significantly improve the way instruction is used in the classroom by using a motivation infused instruction with learning strategies that are explicitly and directly taught to students learning English as a Second Language.