

The Pennsylvania State University

The Graduate School

College of Education

TEXT STRUCTURE KNOWLEDGE OF PRE-SERVICE TEACHERS

A Thesis in

Instructional Systems

by

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Submitted in Partial Fulfillment
of the Requirements
for the Degree of
Master of Science

May 2010

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Abstract

Developing literacy skills, particularly reading and writing, have become a big challenge within schools in the United States. One reason cited for this decline in literacy proficiency is teacher quality. On the other hand, text structure strategy has been one solution provided to help improve reading comprehension and writing ability, and has seen good results in previous research studies. While many studies have found that text structure strategy does in fact improve performance, little research has considered whether teachers understand this strategy. This study examines whether pre-service teachers have knowledge of text structure, and whether they use it in their own reading and writing. The main hypothesis is that the majority of pre-service teachers have little knowledge of text structure strategy. Data was collected from 180 pre-service teachers from The Pennsylvania State University. All participants read two passages, written with distinct text structures used in text structure strategy (comparison and problem/solution), and wrote a recall for each. They then completed a brief survey. The hypotheses and all questions were examined by using results from the self-reported data, and by looking at the recalls to find the mean scores for detail, signaling words, and top level structure. One-sample t tests and independent-samples t tests were used to evaluate the hypotheses. Findings indicate that the majority of pre-service participants have very little knowledge of text structure. One implication is pre-service teachers need more preparation to use text structure strategy before graduating from college.

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I. INTRODUCTION TO THE PROBLEM

Reading and writing are integral to the success of everyone. They are especially essential components for teachers and students. Students have to read textbooks, conduct research on the web, write essays, write responses to questions, create research reports, and much more, which is why being able to read and write well are important skills to obtain. Graham and Perin (2007) state:

Writing well is not just an option for young people—it is a necessity. Along with reading comprehension, writing skill is a predictor of academic success and a basic requirement for participation in civic life and in the global economy. (p. 3)

Outside of school, employees may have to do a wide range of jobs that require them to write documents, produce presentations, create reports, communicate electronically, understand materials, and generate ideas among others (Graham & Perin, 2007). According to the National Commission on Writing (2004, 2005), the majority of private and public employers claim that proficiency in writing is becoming more critical, and that it is a determining factor for whether someone is hired. Rutenberg (2009) noted that adults with lower literacy skills are more likely to earn smaller salaries than those who are more literate. He also states, “Postsecondary education and workforce success depends on literacy” (p. 3). According to Snow and Biancarosa (2004), fifty years ago individuals with lower levels of literacy had access to more well paying jobs, but now many of these types of jobs have gone to other countries. Now, more than ever, good literacy skills are vital for the majority of both young and old looking to succeed.

According to Graham and Perin (2007) many students currently in school are not adequately prepared to read or write well enough to meet the future high demands of college or the workplace. Among employers, 40% claim high school students are deficient in reading comprehension skills, and 72% say that high school students fall short in their writing skills as well (Rutenberg, 2009). However, while efforts are underway to address some of these challenges, the U.S. has made few improvements in terms of reading comprehension and writing (Harris, Graham, & Mason, 2006). Although many new strategies have been set in place to improve these literacy skills, results to date have been less than impressive (Applebee & Langer, 2006; Harris, Graham, & Mason, 2006). One indication of this can be found among the various National Assessment of Education Progress (NAEP) reports which show little progress in the improvement of reading and writing in American schools (2005, 2007, & 2009).

One solution to improving reading comprehension and writing, used with great success in previous research studies, is text structure strategy. The text structure strategy approach has been studied over the past thirty years as a reading comprehension method and has been shown to have a positive effect on comprehension (e.g., Meyer, Middlemiss, Theodorou, Brezinski, McDougall, & Bartlett, 2002; Meyer, Young, & Bartlett, 1989; Meyer & Wijekumar, in review). Recent research on text structure strategy using a web-based tutoring system (ITSS) as the delivery method showed a significant improvement in the number of idea units recalled (in the students' writing of a full recall), writing quality, and main idea (summary) quality (Meyer & Wijekumar, 2007). Meyer and Wijekumar's (in review) own extensive research and other research (De La Paz & Graham, 2002; Harris, Graham, & Mason, 2006) showed that text structure strategy can be an effective intervention for improving both reading comprehension and expository writing.

Unfortunately, little research has been done on teacher quality relating specifically to text structure use. Teachers play a large role in the progress that students make, thus it's important for teachers to be able to use text structure strategy. Past studies on text structure strategy have all used human tutors trained on the method or web-based tutoring that takes teacher quality issues out of the learning environment. However, teachers are significant factors in student learning. Thus it is important that teachers themselves are aware of what text structure is in order to teach students how to use it.

The goal of this research is to identify teacher knowledge of text structure and their ability to use this strategy. Understanding what teachers know about text structure is important because if they do not have adequate knowledge of text structure, then they cannot be expected to teach this strategy to students. One could begin by asking the following questions. Are teachers being made aware of text structure strategy in teacher preparation programs? Do they use this strategy in their own reading and writing? Are they able to help their students use this strategy as well? Teachers cannot be expected to teach what they do not really understand themselves. This study looks at what knowledge pre-service teachers have of text structure strategy, and whether or not they use it in their own reading and writing. This study describes current research on teacher quality, describes the significance of the planned research, looks at the current state of reading comprehension and writing in schools, synthesizes the research supporting the structure strategy as a viable solution to the problem, discusses the research methods for this study, and describes the data analysis techniques.

TEACHER QUALITY ISSUES

Teacher quality issues have been discussed as one area of concern regarding the challenges facing schools today. A report published by the National Commission on Excellence in Education in 1983 is filled with studies that place teacher quality as one of the central issues that U.S. schools face. Some critics have even placed blame on teachers for the decline in student achievement and many other “societal ills” (Ingersoll, 2007). Levine (2006) argues that three quarters of the entire nation’s colleges and universities fail to adequately prepare the teachers they are producing for their future classroom and students. Thus, if Teacher Education graduates are not adequately prepared for teaching in classrooms, the quality of their teaching will in turn have an effect on their students learning.

Students spend a large portion of their day in the care of teachers. As a result, teachers have a lot of influence on students, and they play a large role in shaping students’ learning and growth (Ingersoll, 2007). According to Levine (2006), teachers can be instrumental in making improvements in reading and writing, and especially in the many diverse domains that they support. Support for the idea that teachers are significant contributors in the achievement of students is on the rise (e.g., McCaffrey, Koretz, Lockwood, & Hamilton, 2004; Rowan, Schilling, Ball, & Miller, 2002; Sanders, 1998; Scheerens & Bosker 1997). Sanders and Rivers (1996) found that students with similar achievement levels have “vastly different academic outcomes as a result of the sequence of teachers to which they are assigned” (p. 6). Results similar to those found by Sanders and Rivers have been recorded by others (e.g., Jordan, Mendro, & Weerasinghe, 1997). Gere and Berebitsky (2009) suggest that increases in research on teacher quality issues is related to the growing pool of evidence that quality of teaching has a big effect on student achievement (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2007; Provasnik & Young, 2003; Rice, 2003). Also, various studies have found a positive relationship between years of teaching experience and student achievement (Biniaminov & Glasman, 1983; Ferguson, 1991; Greenwald, Hedges, & Laine, 1996; Murnane, 1981).

In 1992, five different dimensions for teacher quality were identified by Kennedy (Carlson, Lee, & Westat, 2004). These included credentials, tested ability, demographic representation, professionalism, and classroom teaching practices. Kennedy supports her five dimensions of teacher quality with her numerous research studies done on student achievement (Carlson, Lee, & Westat, 2004). This leads one to believe that teachers need to be well prepared and ready because of the large amount of influence they have on their students.

The issue of the quality of teachers has become a focus as more emphasis is being placed on improving education for K-12 students (e.g., Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2007; Provasnik & Young, 2003; Rice, 2003). Gere and Berebitsky (2009) note that there are at least 15 reports focusing on teacher quality from a “public policy perspective” were created between 2000 and 2005 alone (p. 247). Robelen (2009) noted in *Education Week* a statement made by President Obama at an address to the U.S. Hispanic Chamber of Commerce in March 2009: “We’ve let our grades slip, our schools crumble, our teacher quality fall short, and other nations outpace us.” President Obama also noted at his address that we need to hold higher standards and do a better job of preparing all children in school. Policies such as the No Child Left Behind act are beginning to focus on the importance of teacher quality as well, but there is little consensus regarding what defines an effective teacher (Phelps, 2009). However, it is surprising that with the rising number of studies about teacher quality, very little research has focused attention on the quality of reading and writing with teachers of all domains.

Teachers in all subject areas require skills to support student reading and writing in their classrooms (Ehren, 2009). Reading teachers need to be knowledgeable in literacy skills, and are required to understand the intricacies of comprehension as noted by Phelps (2009). Phelps states that there is evidence (e.g., Hoffman and Pearson 2000; National Board for Professional Teaching Standards (NBPTS) 2001; National Reading Panel 2000; Snow et al., 2005) to support the following:

...the reading ability and related knowledge of literature adults is insufficient for teaching the elementary subject of reading. Reading teachers need detailed knowledge of language, text, and reading development to make sense of curriculum materials, to understand student work, and represent reading tasks and materials in a way that can foster students’ learning. (p. 138)

However, teachers of other domains need to have strong literacy skills as well. Ehren (2009) states that “...secondary teachers think of themselves as subject area teachers, without necessarily acknowledging their role in explicitly teaching reading comprehension of their text material” (p.192). All teachers, no matter what subject domain they focus on, need to know how to read and write well, and they need to be able to prepare their students with these literacy skills as well.

Most Americans believe that that helping teachers improve their own teaching would be a more effective way to help students learn how to write and read better, rather than focusing on testing

students. Russonello and Stewart (2009) found that two-thirds of Americans agreed that putting time and resources into helping teachers teach writing to their students is more likely to help students improve their writing, rather than putting so much into testing students to see how well they are learning to write. Given the connection between teacher quality and student preparation, we need to help our teachers be prepared. Teachers need to be able to help their students improve their reading comprehension and writing abilities.

SIGNIFICANCE OF RESEARCH

As stated above, the purpose of this study is to understand what pre-service teachers know about text structure. Moreover, are pre-service teachers able to use text structure strategy in their own reading and writing? It is important to know whether or not teachers understand what we are expecting their students to learn. If we want students to benefit from using text structure strategy, then it is important to know if teachers understand it first. Two questions guide this research:

- 1). What knowledge do pre-service teachers have about text structure? Moreover, what are pre-service teachers able to demonstrate regarding text structure strategy in their recalls?
- 2). Do pre-service teachers use text structure strategies in their own reading and writing?
 - Can pre-service teachers identify the signaling words related to text structure in their reading comprehension?
 - Can pre-service teachers recall the details from the passages that they read?
 - Can pre-service teachers understand and use top level structure?

Exploring these questions will help us to understand what pre-service teachers actually know about text structure strategy, and whether or not they are able to use it on their own reading and writing.

The extensive research on text structure and text structure strategy does not focus on teacher skills in understanding and using text structure in their own reading comprehension or writing. The research on teacher quality has focused on overall abilities of teachers in their domains and never delved into the

text structure skills. This research study focuses on what pre-service teachers know about text structure, and their ability to use it in their own reading and writing.

My hypothesis is that most pre-service teachers know little about text structure strategy. While some may have been exposed to text structure strategy before, this study will explore the extent to which they actually understand it. Teaching text structure strategy to their students will be difficult if teachers themselves do not understand the different methods and strategies it uses. Because of this, pre-service teachers need to be able to use text structure on their own before we can expect them to teach this strategy to their students.

II. BACKGROUND LITERATURE

The lives of students are filled with reading and writing; whether it is for school, pleasure, or a number of other reasons. Many basic tasks of a normal routine may include hundreds to thousands of instances in which a student must either read or write something to complete a task-at-hand. In 2009, Americans named reading as being a skill that should be required for high school graduation, with writing being placed as a top priority just below reading for high school education (Russonello & Stewart, 2009). Russonello and Stewart also emphasized the importance of reading and writing, saying that many Americans believe that the two go hand-in-hand. Additionally, nearly three-quarters of Americans believe that students should learn how to read and write at the same time, rather than learn to read in order to write (Russonello & Stewart, 2009). This is why it is important to look closely at problems with both reading and writing in schools.

PROBLEMS WITH READING COMPREHENSION IN U.S. SCHOOLS

Americans need to have strong literacy skills to succeed. Students who do not gain these skills throughout their time in school will face many disadvantages (Graham & Perin, 2007; Rutenberg, 2009). With such high importance placed on reading, it is surprising to learn that nearly eight million Americans between fourth and twelfth grade have difficulty reading at their own grade level. One of the biggest reasons for this difficulty is they do not “comprehend” what they are reading (Snow & Biancarosa, 2004). According to Rutenberg (2009), there have been 15 million students over the past 15 years who have graduated from high school reading below the basic reading level.

Many students in school read below basic level. According to the 2007 NAEP, one-third of 4th grade students and nearly a quarter of 8th grade students performed below the basic reading achievement level. From 2005 to 2007, the percentage of students performing at or above this level showed little change. Only a small percentage of students read at a skilled level. NAEP reported that only 25% of 4th graders and 28% of 8th graders read at a proficient level. The average reading score for 4th graders did not change from 2007 to 2009, while 8th graders improved, but only by one point. In 2009, NAEP’s report showed that only 8% of 4th graders are reading at an advanced level, 34% are at the basic reading level, and 33% are below the basic level. From 1992 to 2009 (over 17 years) the percentage of 8th graders reading at or above the proficient level only increased by 3% (29% to 32%). Also, according to NAEP’s 2005 report, only 35% of 12th graders are reading at this level. Furthermore, the reading scores

of 12th graders, assessed by NAEP, actually dropped 6 points from 1992 to 2005. During President Obama's address to the U.S. Hispanic Chamber of Commerce, he made note of these issues and point out that just a third of 13-and 14-year-olds can read as well as they should be able to (Robelen, 2009).

According to the Alliance for Excellent Education, about seven thousand students drop out of high school every day. One of the most common reasons for this, noted by Snow and Biancarosa (2004), is they "simply do not have the literacy skills to keep up with the high school curriculum, which has become increasingly complex" (p. 7). Experts in adult literacy from NAEP agree with these findings, and have found that nearly 70% of students struggle with reading in some way or another. Snow and Biancarosa (2004) also noted that approximately 32% of students heading to college have very little chance of succeeding in college English courses because of their poor literacy skills.

Reading comprehension from expository text is a vital part of academic success (National Educational Goals Panel, 1999). Being able to understand and remember information from what is read is also extremely important to further extend intellectual abilities (Ackerman, 1998) and continue practical independence (e.g., health maintenance and financial management) (Meyer, Talbot, Poon, & Johnson, 2001). Being able to understand expository text is becoming more important every day as people are becoming more technologically advanced (Alexander & Jetton, 2000; Lapp, Flood, & Ranck-Buhr, 1995). Reading is a big part of the majority of people's live, but yet reading comprehension of many students in school has become a big challenge that needs to be overcome.

PROBLEMS WITH WRITING IN U.S. SCHOOLS

The National Commission on Writing found that both parents and students agree that good writing is a critical skill to achieving success (2006). The commission's research shows that 83% of parents and teens feel there is a much greater need for writing well in comparison to twenty years ago. Also, about 86% of teens felt good writing is important to success in their life; 56% of those teens described it as being essential, while 30% as being important (National Commission on Writing, 2008). These statistics show that people view writing as being a critical skill, and past research has shown that it is. It is crucial that students learn how to write well while in school (Harris, Graham, & Mason, 2006). Students, however, are not being taught how to write well. Employers and educators continue to express their concern with the quality of writing among workers and students (National Commission on Writing, 2004). The

National Commission on Writing (2008) also recently reported that there is a huge concern regarding the quality of writing that students are producing at college level.

According to 98% of Americans, learning to write well is important, and three-fourths of Americans think schools need to place more emphasis on teaching students how to do this (Russonello & Stewart, 2009). Graham and Perin (2007) argue that writing is not just an option anymore, "it is a necessity." Both believe that teaching writing skills to adolescents has not received the attention it deserves from educators and researchers. To support their view on writing, they list several staggering statistics which include the following:

- 70% of students (grades 4-12) are categorized as low-achieving writers
- 50% of high school graduates are not considered ready for college-level writing by college instructors
- More than 60% of government employees say that promotional decisions are affected by employee writing skills

How well students write is greatly dependent on how well they are taught to write, but with the little research that has been done to learn about the contemporary writing practices in classrooms within high schools in the United States, it's hard to know what needs to be done. Kiuvara, Graham, & Hawken (2009) stated the following:

If high school teachers are to assign writing activities that facilitate content learning and foster students' writing development, as well as provide effective writing instruction (using evidence-based practices, assessing students' progress, and adjusting instruction as needed), they must receive proper preparation to teach writing. The responsibility to provide such preparation rests in part with college teacher preparation programs. It also rests on the efforts of school districts to provide in-service preparation as well as the efforts of individual teachers to obtain needed information. (p. 153)

Evidence from prior research and testing results suggest that there is reason to be concerned with current practices of writing instruction. However, efforts to develop better writing skills are practically nonexistent in school reform efforts in the United States. An example of this is found when looking at the No Child Left Behind legislation, where writing is almost completely absent. The National

Commission on Writing has been arguing that writing should be the core of the legislation (Kiuahara, Graham, & Hawken, 2009). The need for reform within our schools is great, but the question is, what should be done?

Writing instruction has been researched much less than reading instruction (Graham & Perin, 2007). However, there have been some solutions proposed to solve the problem with writing quality. These range from process writing, explicit teaching of skills and processes, self-regulated strategy development model (SRSD), Writer's Workshop, scaffolding writing, word processing, to the requirement of requiring students to do extra writing in the classroom. In 2008, the National Commission on Writing conversed about topics such as making writing central to the school reform agenda, ensuring that the curriculum in schools provide the needed time for students to use writing to learn and to learn to write, and advancing writing assessment that is fair and authentic. The National Writing Project is currently searching to find different ways to help teachers' improve their own writing, so that they in turn can help improve their students' writing abilities (National Writing Project, 2007). Graham and Perin (2007) suggest writing interventions such as: writing strategies, summarization, collaborative writing, prewriting, sentence combining, and more. These interventions combined with other ones led Graham and Perin to suggesting the use of self-regulated strategy development (SRSD). SRSD emphasizes expository text writing through extensive planning, writing, and revising. It allows students to pick their choice of topic to increase motivation. While all the solutions to the writing problems have shown some promise, none have shown consistent improvement and point to the need for improving teacher quality related to the delivery of the methods.

SYNTHESIS

Text structure strategy is a reading strategy used for understanding expository texts (e.g., Meyer et al., 2002). It focuses on patterns that are commonly used by authors to arrange expository texts and to reveal main ideas. These patterns work together to show the logical structure of text being examined. The idea of following an author's structure of text is not new (e.g., Meyer & McConkie, 1973), and it is actually considered a component of good reading comprehension. According to Meyer, Wijekumar, Middlemiss, Higley, Lei, Meier, and Spielvogel (in press), good readers use their understanding and knowledge of text structure to create "coherent memory representations" (p. 63). Text structure strategy shows learners how to follow logical structure by using different text structures (e.g., problem

and solution, comparison), which increases comprehension of text. The key is organizing information and ideas that “convey” main ideas. Readers using text structure strategy learn to recognize different structures to increase their understanding. For example, they learn to recognize signaling words such as “in contrast,” “problem,” or “differences. “ These signaling words “clue” readers about which top-level structure (TLS) is being used. They can then use these to create their main idea and later be able to better recall what they just read. The National Reading Panel (2000) identified the use of structure in stories to help children recall information as one of seven types of instruction, backed by solid evidence, that demonstrate improvement in reading.

Writing and reading comprehension share many of the same knowledge and cognitive processes. Information about text structure, the shared cognitive processes related to reading and synthesizing information that are required for creating and/or summarizing expository texts (Reynolds, 2006) are two examples. Because of this basic shared knowledge, the organization of content structure in memory can be used in summarizing and recalling expository texts (Englert, Raphael, & Anderson, 1991). Therefore, Meyer and Wijekumar (in review) suggest using text structure strategy with students to help with reading comprehension, and writing. Text structure strategy will help students organize their reading, and help them use better strategies for remembering what they are reading and writing about it. Text structure strategy presented by Meyer and Wijekumar (2007) teaches students to find signaling words in expository texts that classify the text into a TLS. TLSs are comparison, problem/solution, cause-effect, sequence, or description. Wijekumar and Meyer (2010) note:

The overall top-level structure (TLS) can provide the primary framework for integrating other structures, such as comparison between an undesirable solution and the author’s favored solution along with its detailed description. Knowledge of such text structures and a reading strategy to use them can be readily applied to well-organized text. (p. 64)

Once a student identifies the TLS, they are shown how to construct a main idea for that text structure (see Table 1). This main idea combined with the signaling words forms the basis for the student’s recall and writing.

In recent studies, text structure strategy has shown promising results for improving writing (Meyer & Wijekumar, 2007; Reynolds, 2006; Hammans & Stevens, 2003). Reynolds (2006) found, in a study on content knowledge, that students in a text structure strategy group (treatment) outperformed a control group and the other group (treatment 2) that received self-regulated instruction. Results from Reynolds

study showed a big improvement in the quality of writing of students who used text structure strategy to organize their writing. In technical terms, the effect size was 2.66 for those using the structure strategy instruction compared to 1.39 for the self-regulation only group. Text structure is a powerful tool that can be used to solve both the reading comprehension and writing challenges facing our schools today.

Table 1. Patterns for Writing with the Comparison and Problem-and-Solution Structures

Comparison Structure	
Pattern for writing main idea	_____ and _____ (two or more ideas) were compared on _____, _____, and _____. For example, killer whales and blue whales were compared on size, color, and life span.
Pattern for writing Recall	Sentence with a comparison signaling word contrasting the two ideas. The first idea is _____ (describes the topics/issues for this idea). In contrast, the second idea is _____ (describes the topics/issues for this idea).
Examples of signaling words	instead, but, however, or, alternative, whereas, on the other hand, while, compare, in contrast, in opposition, not everyone, all but, similarities, share, resemble, the same as, unlike, despite, although, just, options, difference
Problem/Solution Structure	
Pattern for writing main idea	The problem is _____, and the solution is _____. For example, the problem is seven endangered whale species, and the solution is a whale sanctuary in the Antarctic Ocean.
Pattern for writing Recall	The problem is _____ [paragraph(s) includes a description of the problem(s) and, if known, its cause(s)] _____. The solution is _____ [paragraph(s) includes a description of the solution(s) and how it blocks the cause(s) of the problem or reduces the problem] _____.
Examples of signaling words	problem, trouble, difficulty, hazard, need to prevent, threat, danger, puzzle, question, query, riddle, perplexity, enigma, solution, ways to reduce, to solve these problems, answer, recommendation, reply, response, suggestions

(Meyer, Wijekumar, Middlemiss, Higley, Lei, Meier, & Spielvogel, in press)

Meyer and Poon (2001) noted that there are a number of studies that show signaling positively affecting the recall of information (Loman & Mayer, 1983; Lorch, Lorch, & Inman, 1993; Meyer & Rice, 1989), organization (Lorch et al., 1993; Meyer et al., 1980), processing speed (Haberlandt, 1982; Millis & Just, 1994), and cued recall (Millis & Just, 1994). In their 2001 study, Meyer and Poon recruited 56 young

adults and 65 older adults. They randomly selected which participants would be assigned to the three groups: training with text structure strategy, training with interest-list strategy, or the control group which would have no contact with either training. Participants in the training groups with both structure strategy and interest-list strategy attended six 90 minute sessions spread over three weeks. Participants used the same materials and received the same amount of training. The training for both groups was done by the same individuals. The results from their study were promising, showing that text structure strategy does improve reading performance. They found that training both young and old participants in text structure strategy increased the amount of information they recalled from their reading. Participants trained with text structure strategy remembered significantly more information than those who were trained with text structure strategy. Meyer and Poon were able to conclude that training with text structure strategy increases recall of the most important information and that it increases correspondence between recall and text organization. Participants trained with text structure strategy were also found to have benefited more than those trained with interest-list strategy. The results from this study show that readers can be trained effectively to use text structure strategy, and that reading performance will be enhanced when applying text structure strategy to reading and writing methods.

Although structure strategy has been used in many research settings, with young and old readers, and improves reading comprehension and writing, there has never been a focus on whether teachers understand text structure strategy. Therefore, this study was designed primarily to understand whether teachers understand how text structure strategy works, and if they apply it to their own reading and writing. Studies have shown that using this strategy will enhance reading and writing performance, but students cannot be trained to use this without their teachers first understanding it. Once teachers understand this strategy, they will be in a better position to teach their students how to use it.

III. RESEARCH METHODS

Samples of future teachers from all domains were tested on whether or not they truly understand the text structure method. In this study, we look at results regarding how prepared students in a teacher education program are to use text structure strategy to organize their own reading and writing. This data gave us insight about whether or not these future teachers are able to train students on how to use this strategy to improve reading comprehension and writing in schools.

The first research question is: What knowledge do pre-service teachers have about text structure? Furthermore, what are pre-service teachers able to demonstrate regarding text structure strategy in their recalls? To answer this question, pre-service teachers were given a simple and brief survey (see Appendix D) that asked them what text structure is, if they use text structure, and what text structures they are familiar with. Participants also wrote two recalls of passages that they were asked to read. These recalls were designed to help us understand whether pre-service teachers have knowledge of text structure by the way they write and organize these recalls.

The second research question is: Do pre-service teachers use text structure strategies in their own reading and writing? This can be further broken down into three sub-questions:

- Can pre-service teachers identify the signaling words related to text structure in their reading comprehension?
- Can pre-service teachers recall the details from the passages that they read?
- Can pre-service teachers understand and use top level structure?

To answer these questions, participants were given two different passages to read which were well organized with clearly identifiable TLS. The two passages participants read used comparison and problem/solution TLS. Since the hypothesis is that most pre-service teachers do not have much knowledge about text structure strategy, the assumption was that most will have no effective strategy for utilizing the TLS of the passages (Meyer et al., 1980). Explaining these questions allowed us to gain an understanding about whether pre-service teachers could organize their reading and writing using text structure.

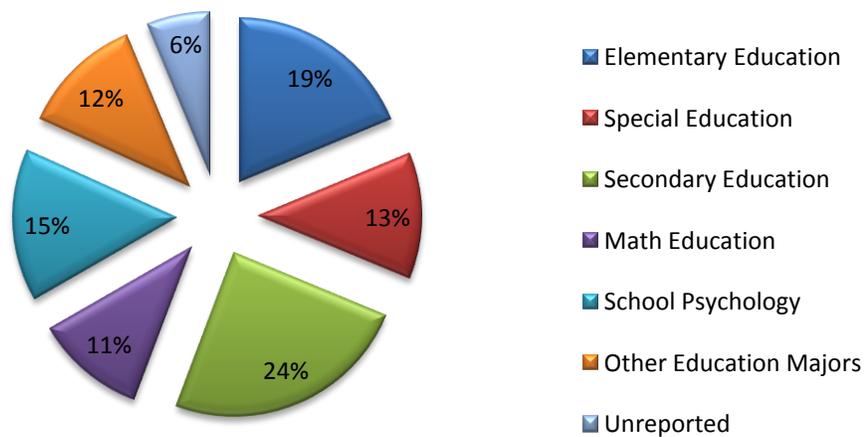
Two well-organized passages of expository text with clearly identifiable TLS and appropriate reading levels for college students were selected for the study. The passages utilized comparison and

problem/solution TLS. The choice was made to use passages with these structures because they are found frequently in the text of school materials. The TLS for each passage was identified by analyzing the passage with the prose analysis procedure described by Meyer (1975a, 1975b). The comparison (adversative) passage dealt with circles and heads and compared two contrasting views; this passage can be found in Appendix C. The passage contained 527 words and has been used in previous research studies (e.g., Meyer, Young, & Bartlett, 1989). The problem/solution passage (containing 506 words) dealt with trusts, and can be found in Appendix B (Meyer, 1980).

PARTICIPANTS

180 students in the college of Education’s teacher education programs, at The Pennsylvania State University participated in this study. Participants were recruited from classes in the education program and included students from all domains. They were invited to participate through classroom presentations. Those who participated received three extra credit points from their professor. The alternative to participating in this research study was to write a 1-2 page essay on a topic provided by their professor. There were 44 males and 130 female participants, and the gender of 6 participants was unknown. The mean GPA was 3.3 (sd =.5085). Figure1 below presents the breakdown of participants by major.

Figure 1. Breakdown of Participants by Major



MATERIALS

All participants completed an assessment of text structure use with two text structures – comparison and problem/solution. Each participant was given a packet that contained a consent form, an introduction page, two reading passages which were used in previous research studies on text structure (Meyer, Young, & Bartlett, 1989; Meyer & Wijekumar, 2007), and a survey. Each participant also received an envelope to place all of their materials into, ensuring that everything was kept together, and that everything remained confidential. The first reading passage presented in Appendix B was a problem/solution expository text passage on trusts used in previous research studies (Meyer, Young, & Bartlett, 1989). The passage contained 506 words and 193 scorable idea units. Before reading this passage, participants read directions at the top of the page. After completing the reading, participants tore the page off and inserted it into the envelope provided. Participants then wrote a full recall of this passage without referring back to the passage that they just read.

The second reading passage presented in Appendix C was a comparison text passage on circles and heads. This passage contained 527 words and 193 scorable idea units. Like the first passage, participants read the directions at the top of the page; read the article; tore the page with the article on it out of their packets and inserted it into their envelope; and without referring back to the passage participants wrote a full recall of the passage.

After finishing both readings and doing both recalls, participants also completed a brief survey. This survey is presented in Appendix D and was designed to collect demographic data and self-reported information on the pre-service teachers' knowledge about text structure. Participants were asked to answer six basic questions about age, gender, major, and also about their knowledge and use of text structure.

PROCEDURE

First, participants were administered informed consent forms. After reading and signing the consent form, they then began reading the "Welcome" page, which contained a brief overview of the activities and a summary of directions (Appendix A). Participants were instructed to work through their packet at their own pace. Subjects were told:

Read each article as you would a magazine article of interest to you. After reading each article, tear the page off and place it in your envelope. Then, write down as much as you can remember on the provided paper. We want to see how many ideas you remember and if you remember how the ideas were interrelated. Please use full sentences or paragraphs, rather than just listing words.

To ensure that participants did not look back at the passage while writing their recall, the page with the passage on it was torn from the packet and placed into the provided envelope. After placing the article into the envelope, participants then wrote a full recall of what they remembered from what they had just read. Participants then read the second passage in the packet. After reading this passage, they tore it out of their packets and placed it into their envelope. Participants then wrote a full recall for this passage as well. After completing the recall of both articles, participants completed a survey. Once participants finished the survey, they checked to make sure everything was in their envelope. They then sealed their envelope and handed it in to the researcher. Similar protocol was followed by Meyer, Young, Bartlett, 1989.

SCORING OF ASSESSMENT

Scoring was completed using hierarchical text structure maps created by Meyer, Young, Bartlett (1989). The recalls were scored on signaling words, TLS, and details remembered. The use of the text structure pattern was scored on a scale of 1 to 7. One point was given for each aspect of the questions correctly answered, passage correctly sorted, or topics correctly recognized. The underlying task was scored by counting the number of high and low ideas from the content structures of the texts that were underlined as important by a subject (Meyer, Young, Bartlett, 1989, p. 56).

Recall protocols were scored using Meyer's (1975a) scoring procedure; two independent trained scorers scored each recall using the Meyer protocol. In addition to the total number of idea units recalled from the passage (total recall score), an index was given for the degree to which the student recalled the most central ideas of the passage. Idea units recalled that corresponded to the top-level rhetorical predicates, and related content at the highest level of the content structure of the passages were credited two points. Major idea units at the second and third level were credited one point; none of the other lower levels (seven levels for both passages) were credited. This score is called the central idea

score. A weighted recall score consisted of the sum of a student's total recall score and central idea score.

Content structures of the passages were divided into thirds to examine any differences in processing different types of information between participants who did and did not utilize the TLS of text. Levels one and two in the content structures of the passages were labeled the message. The supporting major details were located in levels three and four in the content structure and the minor details were located in levels five and lower.

The TLS of each protocol were analyzed to determine whether or not its top-level rhetorical structure was the same as that used by the author of the text. If the protocol was organized into two related clusters of ideas, one related to problems and the other related to solutions for these problems, the protocol's content structure was organized with a problem/solution TLS and classified as using the same organization as the author. For those protocols organized with the same structure as the author's, seven to ten points were assigned. Ten points were given if the previous requirements were met and the student used the words "problem" and "solution" in his or her protocol. Nine points were given if only "solution" was explicitly stated; eight points were earned if only "problem" was stated and seven points were given if the above requirements were met, but neither the word "problem" nor "solution" appeared. Five points were given for a protocol which stated explicitly or implicitly in one sentence that there was a problem and solution, but simply listed ideas from the passage without organizing the problems and solutions in related clusters. Three points were given if some other conceptually related hierarchical structure was used besides that found in the original text (list-like collections of descriptions were excluded from this category); as expected very few (4 of the 408 protocols) fit into this classification. Two points were given for a protocol where no explicit or implicit mention was given to problems or proposed solutions and the ideas were organized into a collection of descriptions. One point was assigned to a protocol that implied no problems or solutions and presented a random listing of ideas from the passage which were not collected under any one topic. Protocols scored with five to one points were classified as not using the author's organization. Inter-rater reliability (.97) was calculated based on the scoring of the two independent raters for all the scored passages.

DATA ANALYSIS

Participants completed a survey about text structure strategy, which allowed us to gain insight about the knowledge that these future teachers have about this type of writing. Text structure strategy is an essential writing skill that students should have, but how will they have it if their own teachers do not have the basic comprehension about this type of writing? It is important that teachers understand this way of writing, so it is important to know whether or not teachers are prepared to use text structure strategy in the classroom.

Research Question 1 asked:

What knowledge do pre-service teachers have about text structure? Moreover, what are pre-service teachers able to demonstrate regarding text structure strategy in their recalls?

Two sources of information were used to explore the first question. One was the survey, where participants are specifically asked three questions about their knowledge of text structure. The other was their actual recalls, which were looked at and judged to see whether they really understood text structure. Participants may claim in the survey that they know what text structure is, and that they use it in their own reading and writing, but their written recalls provide practical evidence of their understanding of text structure. Being able to read their recalls and see whether or not they really did have knowledge about how to use structure strategy was important. The survey data was summarized to identify whether the pre-service teachers identified any of the five basic text structures in their self-reported responses.

Research Question 2:

Do pre-service teachers use text structure strategies in their own reading and writing?

- Can pre-service teachers identify the signaling words related to text structure in their reading comprehension?
- Can pre-service teachers recall the details from the passages that they read?
- Can pre-service teachers understand and use top level structure?

In order to answer this research question the scored protocol data for comparison and problem solution recall passages were analyzed using simple statistical means of the responses for TLS, main idea,

signaling words, and details recalled by the respondents. Correlational analysis was conducted using the demographic information and the scores from the recalls.

Additional analysis was conducted to study whether the pre-service teachers' self-reported information confirms their knowledge in the scored recalls and knowledge of text structure.

IV. RESULTS AND FINDINGS

This chapter examines the use of text structure by pre-service teachers. The results are organized by research questions.

RESEARCH QUESTION ONE

What knowledge do pre-service teachers have about text structure? Moreover, what are pre-service teachers able to demonstrate regarding text structure strategy in their recalls?

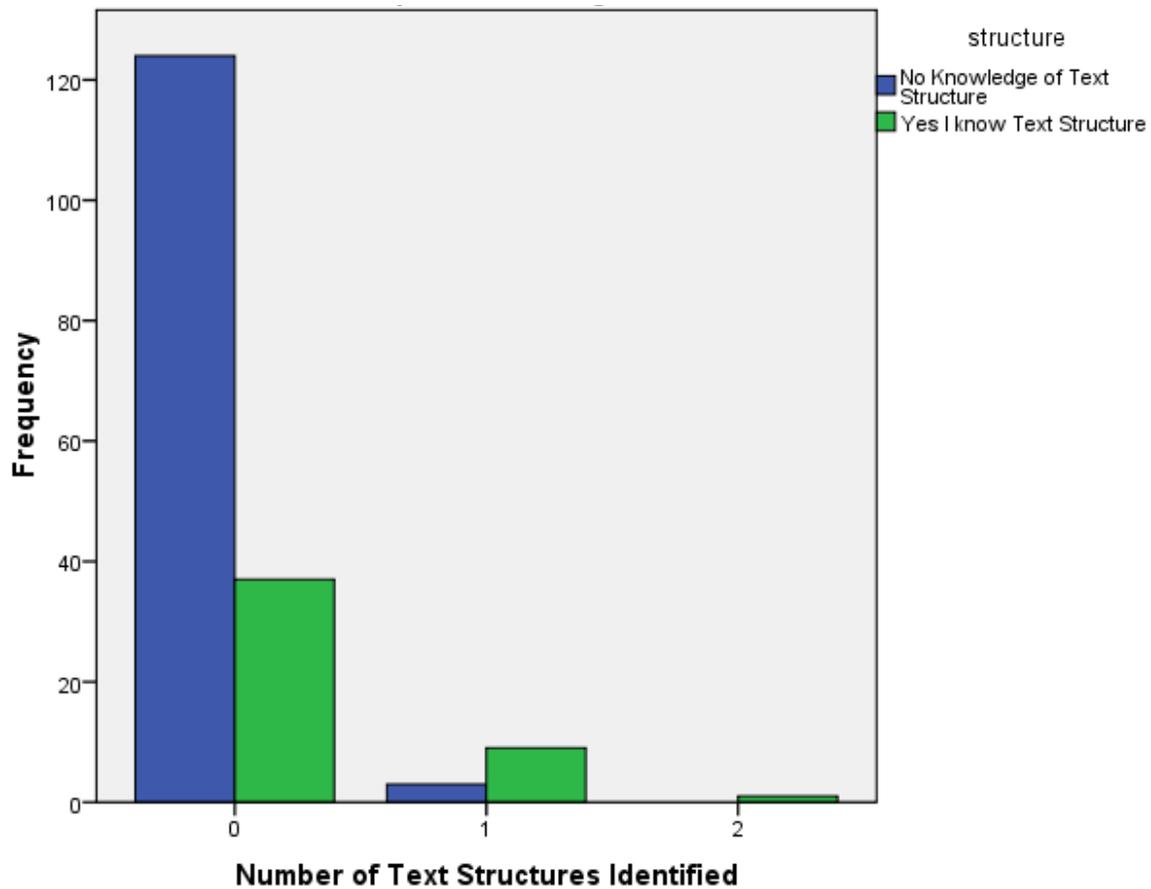
In order to answer this research question, data was reviewed from two sources. The first source was the survey instrument and the second were participants' recalls. The survey served as self-reported knowledge on text structure, and was then verified using the actual performance of participants on the two recall tasks.

First, Figure 2 presents a summary of descriptive statistics on the number of text structures identified in comparison to whether or not they claimed they do use text structure when doing their own reading.

The majority, 70.6% of the 180 respondents, stated they do not identify text structures when reading expository texts. Within this majority, 97.6% could not identify any of the five text structures. The remainder, 2.4% of participants, were able to identify one text structure.

The rest of the 180 participants, 29.4%, stated they do identify text structures when reading expository texts. None of these participants were able to identify all five of the text structures. Within this majority of participants who claimed they do identify text structures, 78.7% of them could not list any of the text structures. Furthermore, 19.1% of these participants were able to name just one text structure and only 2.1% of these participants named two text structures. A one-sample t test was conducted to evaluate the hypothesis that the majority of pre-service teachers are not able to accurately identify the five text structures. The test was significant, $t(173) = 3.620$, $p < .01$. Also, of the 180 participants, only 6 of them were able to correctly define what text structure is when asked, "What is text structure?"

Figure 2. Self-Reported Answers to Use of Text Structure



Next, analysis on the recall of the comparison and problem/solution text was done to study whether the participants used text structure in their reading comprehension. This data is presented on text structure use by breaking down the recalls into TLS, signaling words, and detail scores. Table 2 presents the means and standard deviations for each area.

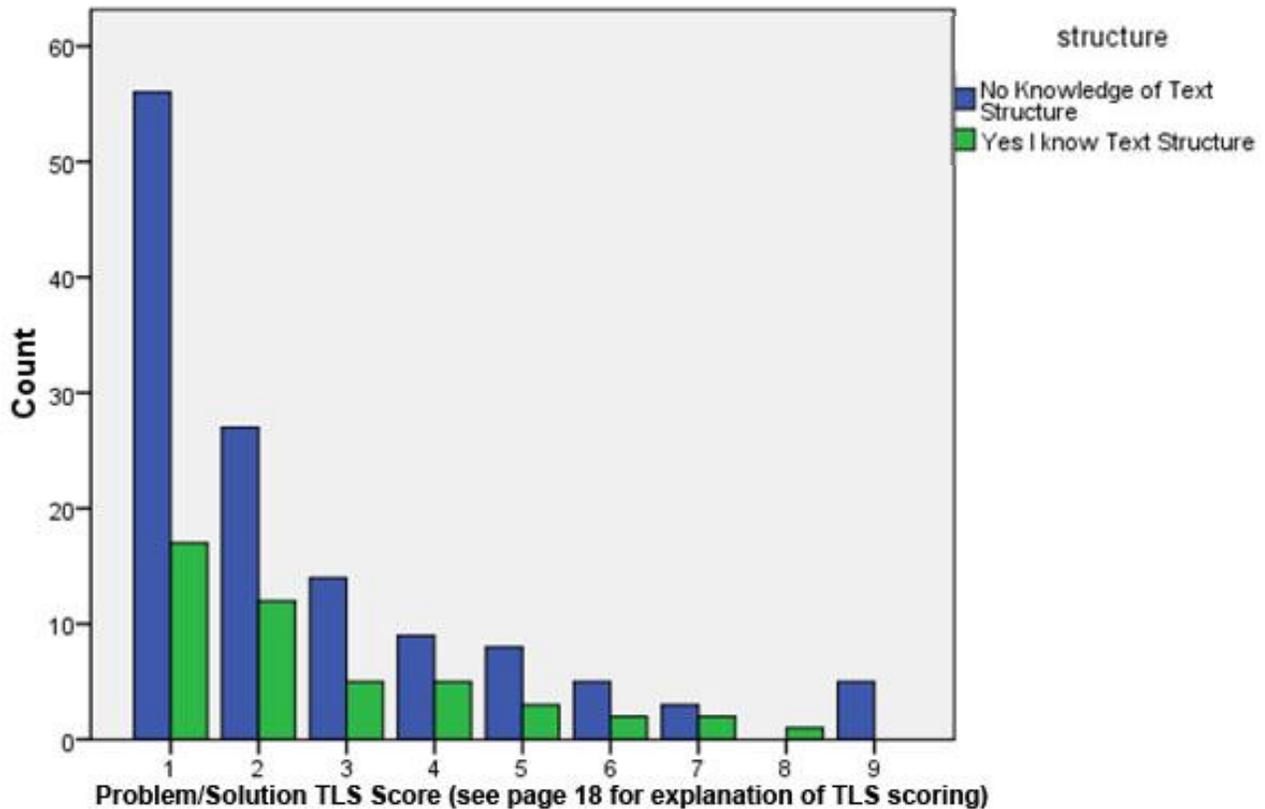
As described earlier, TLS was scored using Meyer's (1975a) scoring procedure. The results are shown in Table 2. The mean on TLS was 2.54 (sd =2.0) for the problem/solution passage. The maximum possible score for TLS was 10 and the minimum was 1. A one-sample t test was conducted to evaluate the hypothesis that the majority of pre-service teachers do not use TLS to organize their writing. The test was significant, $t(179) = 17.06, p < .01$. As shown in Figure 3, in the problem/solution passage, 112

participants received a score of 1 or 2, suggesting they do not use text structure to organize their responses; 51 participants received a score of 3, 4, 5, or 6, suggesting they used some text structure, but the problem was described vaguely; only 11 participants scored between 7 and 10, suggesting those participants organized their recall similarly to the author's TLS in the original passage. Of those 11 participants, only 5 scored a 9, and 0 of those participants scored the maximum possible score of 10.

Table 2. Text Structure Use by Education Majors in Study

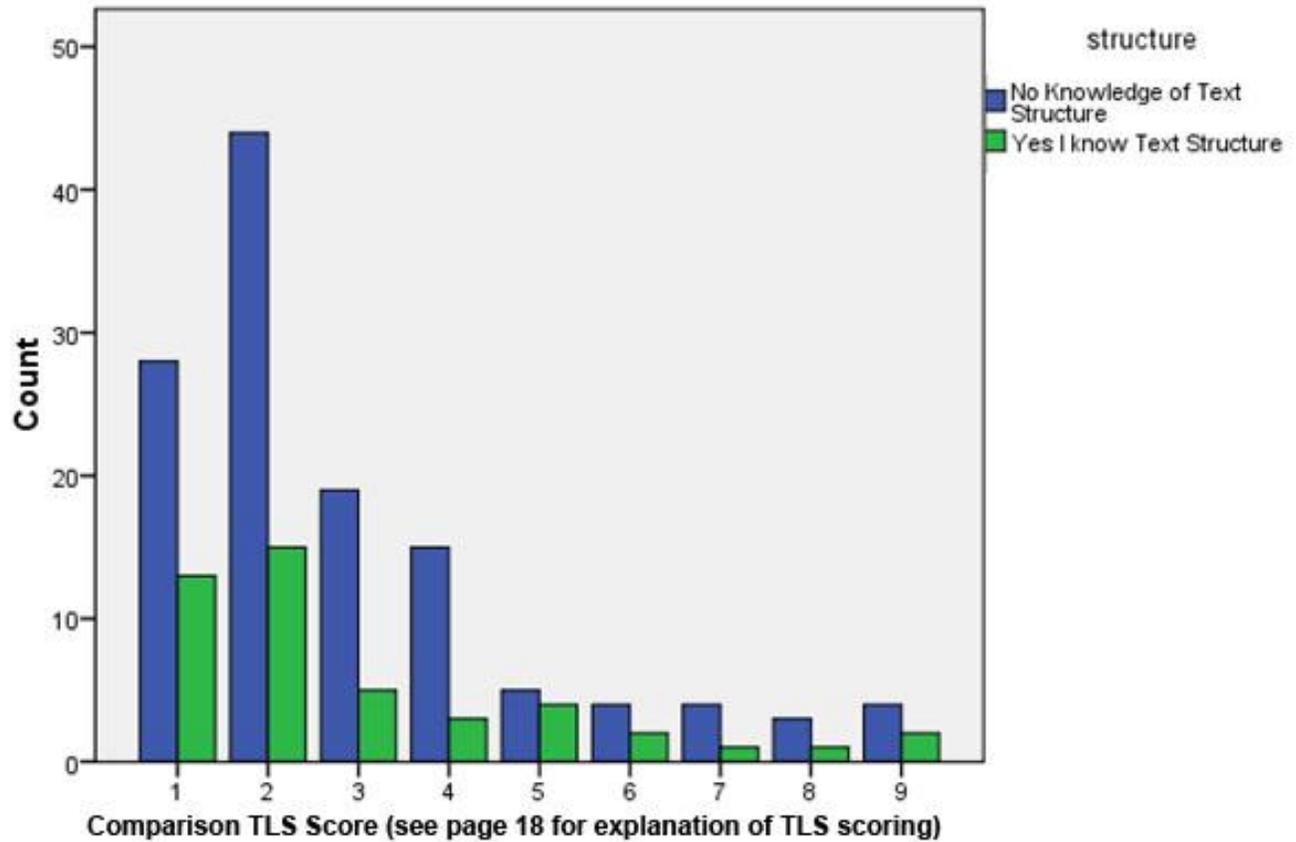
Text Structure	<i>M(sd)</i>
Problem/Solution	
TLS (n=180)	2.54 (2.00)
Signal (n = 180)	1.06 (1.26)
Details (n = 180)	3.56 (1.99)
Comparison	
TLS (n=180)	2.90 (2.04)
Signal (n = 180)	.82 (1.13)
Detail (n= 180)	5.54 (4.01)

Figure 3. Frequency of Top Level Structure Use in the Problem/Solution Passage



In the comparison passage, as shown in Table 2, results are very similar to the problem/solution passage. The mean on TLS was 2.90 (sd =2.04). A one-sample t test was conducted to evaluate the hypothesis that the majority of pre-service teachers do not use TLS to organize their writing. The test was significant, $t(177) = 18.96, p < .01$. As shown in Figure 4, 100 participants received a TLS score of 1 or 2, suggesting they did not use the correct comparison TLS; 57 participants scored a 3, 4, 5, or 6, showing they did use some text structure, but their use of comparison TLS in their writing was vague; only 15 participants received a score of 7, 8, or 9, suggesting they did use comparison TLS to organize their recall, and their use of TLS was similar to the author’s use of TLS in the original passage. Of those 15 participants, 6 participants organized their recall accordingly with a score of 9. None of the participants organized their recall well enough to receive the maximum possible score of 10.

Figure 4. Frequency of Top Level Structure Use in the Comparison Passage



A subgroup analysis was also conducted to study whether participants who reported knowledge of text structure in the survey performed differently than those who reported they did not have knowledge of text structure. Those results are shown in Tables 3 and 4 and in Figures 3 and 4.

Table 3 and Figure 3 show the results for the problem/solution passage. The hypothesis is the amount of signaling words used by participants in the problem/solution passage to organize their writing will not differ based on whether they claimed they do or do not use text structure. An independent-samples t test was conducted to evaluate this information. Assuming variances are not equal, the test was not significant, $t(73.68) = -1.08, p = .285$. Of the 47 participants that said yes, they do identify text structure in their own reading, 40.4% of them did not use any signaling words when they organized their recall. Also, only 4.3% used 5 signing words in their writing. Figure 3 shows a comparison between participants

that said they do identify text structures and those who said they do not identify text structures for their TLS score.

Table 4 and Figure 4 show the results for the comparison passage. The hypothesis is the amount of signaling words used by participants in the comparison passage to organize their writing will not differ based on whether they claimed they do or do not use text structure. An independent-samples t test was conducted to evaluate this hypothesis. Assuming variances are not equal, the test was not significant, $t(98.77) = .47, p = .636$. As shown in Table 4, 51.1% of participants that said they do identify text structure in their own reading did not use any comparison signaling words to organize their recall. Results were similar for those participants that said they do not use text structure: 54.3% of them also did not use signaling words in their recall. However, 9.5% of them used 3-5 signaling words even though they said they do not use text structure in their reading. On the other hand, only 6.4% of those who said they do use text structure used 3-5 signaling words in their comparison recall. Figure 4 shows a comparison between participants that said they do identify text structures and those who said they do not identify text structures for their TLS score.

Table 3. Number of Problem/Solution Signaling Words Used by Participants Reporting Knowledge

			Self-Reported Text Structure Knowledge		Total
			No	Yes	
pssig	0	Count	57	19	76
		% within structure	44.9%	40.4%	43.7%
	1	Count	36	11	47
		% within structure	28.3%	23.4%	27.0%
	2	Count	19	8	27
		% within structure	15.0%	17.0%	15.5%
	3	Count	8	6	14
		% within structure	6.3%	12.8%	8.0%
	4	Count	6	1	7
		% within structure	4.7%	2.1%	4.0%
	5	Count	0	2	2
		% within structure	.0%	4.3%	1.1%
	6	Count	1	0	1
		% within structure	.8%	.0%	.6%
Total	Count	127	47	174	
	% within structure	100.0%	100.0%	100.0%	

Table 4. Number of Comparison Signaling Words Used by Participants Reporting Knowledge

			Self-Reported Text Structure Knowledge		Total
			0	1	
cmpsig	0	Count	69	24	93
		% within structure	54.3%	51.1%	53.4%
1	Count	28	14	42	
	% within structure	22.0%	29.8%	24.1%	
2	Count	18	6	24	
	% within structure	14.2%	12.8%	13.8%	
3	Count	7	2	9	
	% within structure	5.5%	4.3%	5.2%	
4	Count	2	1	3	
	% within structure	1.6%	2.1%	1.7%	
5	Count	3	0	3	
	% within structure	2.4%	.0%	1.7%	
Total	Count	127	47	174	
	% within structure	100.0%	100.0%	100.0%	

RESEARCH QUESTION 2

Do pre-service teachers use text structure strategies in their own reading and writing?

- Can pre-service teachers identify the signaling words related to text structure in their reading comprehension?

The information used to answer this question is presented in Table 2. Participants had a mean of 1.06 on the problem/solution signaling words score. Similarly, in the comparison text participants had a mean of .82 on the signaling word score. The hypothesis is the majority of pre-service teachers do not use many signaling words to organize their recalls. A one-sample t test was conducted to evaluate this hypothesis. The test was significant for the problem/solution passage, $t(179) = 11.25, p < .01$. The test was also significant for the comparison passage, $t(179) = 9.73, p < .01$. The original passage that participants read using the problem/solution structure had 6 signaling words and the comparison passage had 2 signaling words. The passage on trusts (Appendix B) used the problem/solution top level structure, and the passage on circles and heads (Appendix C) used the comparison top level structure.

- Can pre-service teachers recall the details from the passages that they read?

To answer this question, information on the detail mean scores were used (Table 2). The pre-service teachers participating in this study had a problem/solution detail score mean of 3.56 (sd = 1.99) and a comparison detail mean of 5.54 (sd = 4.01). The hypothesis is the majority of pre-service teachers use little detail when organizing their recalls. A one-sample t test was conducted to evaluate this hypothesis for the problem/solution recall. The test was significant, $t(179) = 24.05, p < .01$. A one-sample t test was also conducted to evaluate this hypothesis for the comparison recall. The test was significant, $t(179) = 18.55, p < .01$. The original problem/solution passage had details of 14, and the original comparison passage had details of 20.

- Can pre-service teachers understand and use top level structure?

To answer this question, we looked at the TLS mean scores and standard deviations for the comparison and problem/solution passages. The participating pre-service teachers had a TLS mean of 2.54 (sd = 2.00) on the problem/solution passage and a TLS mean of 2.90 (sd = 2.04) on the comparison passage. A one-sample t test was conducted to evaluate the hypothesis is the majority of pre-service teachers do

not use TLS to organize their recalls. The test was significant for the problem/solution, $t(179) = 17.06$, $p < .01$. The test was also significant for the comparison, $t(177) = 18.96$, $p < .01$. The range on both was a minimum of 1 and a maximum of 9. The percentage of participants that did not use problem/solution TLS to organize their recall was 64.4%, and 58.1% of participants did not use comparison TLS to organize their recall.

V. CONCLUSIONS AND IMPLICATIONS

Reading comprehension and writing in our schools today are a big challenge. Experts in adult literacy from NAEP agree noting that nearly 70% of students struggle with reading in some way or another. One approach to addressing this problem is to use text structure strategy. Recent studies on text structure strategy have shown promising results (e.g., Meyer & Wijekumar, 2007; Reynolds, 2006; Hammans & Stevens, 2003), and Meyer and Poon (2001) note that a number of studies show signaling positively affecting the recall of information (e.g., Loman & Mayer, 1983; Lorch, Lorch, & Inman, 1993; Meyer & Rice, 1989), organization (e.g., Lorch et al., 1993; Meyer et al., 1980), processing speed (e.g., Haberlandt, 1982; Millis & Just, 1994), and cued recall (e.g., Millis & Just, 1994). The method is currently being implemented in large scale studies with support for its effectiveness in improving reading comprehension (e.g., Wijekumar, Meyer, & Lei, 2008).

The one area that has had little review is teacher knowledge and use of text structure in their own reading comprehension and writing. Teachers' knowledge and use can have many implications for the acceptance and application of text structure in classrooms (Dillabough, 2008). This research study was designed to study pre-service teachers' knowledge and use of text structure. This research study used self-reported data (survey) and two reading comprehension tasks designed to identify pre-service teachers' use of text structure in their own reading comprehension and writing. Based on the research on teacher quality indicators and the reading comprehension outcomes of students in K-12 schools we hypothesized that the majority of pre-service teachers have little knowledge about text structure strategy and therefore are unable to transfer that knowledge to learners.

Overall, findings suggest that participating pre-service teachers did not use text structure based on their TLS, main idea, and signaling word scores. The self-reported data also showed that 73% are not aware of text structure. Although a majority of participants said they are not formally aware of text structure, 55.1% showed some awareness of signaling words by using 1 or more signaling words in their problem/solution recall. However, of the 27% who stated they were aware of text structure, 40% did not use any signaling words in their writing. This suggests the participants' understanding of text structure is weak.

Research question one asked what knowledge pre-service teachers have about text structure and what are pre-service teachers able to demonstrate regarding text structure strategy in their recalls? Of the 47

participants who reported when they read expository text they do identify text structures, 78.7% were unable to identify any of the five text structures. We can conclude from these results that participants in this study are not familiar with text structure. Furthermore, virtually all (97.6%) of those who said they do not identify text structures when reading expository texts were also unable to identify any of the five text structures. Across the entire sample ($n = 180$), only 6 were able to correctly define text structure. Based on the self-reported data from the survey responses, it can be concluded that pre-service teachers have little understanding of text structure. A one-sample t test was conducted to evaluate the hypothesis (H1) that the majority of pre-service teachers are not able to accurately identify the five text structures. The test was significant ($p < .01$). Based on the results of the t test, it is reasonable to conclude that these findings are not random, and we can generalize these findings to the larger population of pre-service teachers, not just the ones that participated in this study.

Another source of information used to answer the first research question was whether participants used TLS to organize their recalls. For the problem/solution passage, the mean was 2.54 ($sd = 2.0$). The mean for the comparison passage was 2.90 ($sd = 2.04$). The maximum possible TLS score for both passages was 10. This indicates that TLS used in their recalls for the problem/solution and comparison was low. From this analysis, we can conclude that the majority of pre-service teachers demonstrate little knowledge of text structure strategy in their recalls. A one-sample t test was conducted to evaluate the hypothesis (H2) that the majority of pre-service teachers do not use TLS to organize their writing. The test was significant ($p < .01$) for both the problem/solution and comparison. We conclude that the results are not random and as such are representative of pre-service teachers, not just the ones who participated in this study.

The number of signaling words participants used in their recalls allowed us to see what pre-service teachers are able to demonstrate regarding text structure strategy in their recalls. Participants in this study had a mean signaling word score of 1.06 on the problem/solution passage and only a mean score of .82 on the comparison passage. The problem/solution passage used 6 signaling words and the comparison passage used 2 signaling words. However, signaling words could be used more than once throughout their writing, so the mean score for both the problem/solution and comparison passages were extremely low. Also, the mean on the recall was lower than the actual number of signaling words that were originally used in the passages they read. Table 3 shows how many problem/solution signaling words participants used in their recall in comparison to whether they reported they identify text structure when reading. It is interesting to note that over 40% of participants, who reported they

do identify text structures when reading expository texts, did not use any signaling words to organize their recall. Also, 19.2% of participants used 3 or more signaling words in their writing. Similar results were found for the comparison recall (see Table 4). Over 50% of participants, who reported they do identify text structures when reading expository texts, did not use any signaling words, and only 6.4% of these participants used 3 or more signaling words to organize their comparison recall. Based on these findings, we concluded that the majority of participants were unable to demonstrate any knowledge of text structure in their own writing. An independent-samples t test was conducted to evaluate the hypotheses that the amount of signaling words used by participants in the problem/solution passage (H3) and comparison passage (H4) to organize their writing will not differ based on whether they claimed they do or do not use text structure. The tests were not significant for problem/solution or comparison ($p > .01$), which suggest that the number of signaling words used was not affected by claims of participant about text structure use.

Research question two asked whether pre-service teachers use text structure strategies in their own reading and writing. This question was broken down into sub questions: Can pre-service teachers identify the signaling words related to text structure in their reading comprehension, can pre-service teachers recall the details from the passages that they read, and can pre-service teachers understand and use top level structure? This study answers these question using signaling word ($M = 1.06$), detail ($M = 3.56$), and TLS ($M = 2.54$) scores for the problem/solution passage, and for the comparison passage in which similar scores were found. The averages for the comparison passage were: signaling word ($M = .82$), detail ($M = 5.54$), and TLS ($M = 2.90$). In both text structures, across all three cases, participant responses showed a lack of knowledge and application of text structure. The maximum possible score for TLS was 10. The highest TLS score for participants was 9, but the average participant score was 2.54, suggesting an inability to organize their writing using TLS. Detail scores for both passages were also low. The problem/solution passage contained 14 details, and the average score for respondents was only 3.56. Additionally, the comparison passage contained details of 20, but the participants mean score was only 5.54. Details could be used more than once throughout their writing, so detail scores could have been much higher than the number of details actually used in the original passages. The signaling word mean scores for the problem/solution and comparison passages were also low. The average use of signaling words for the problem/solution passage was only 1.06, and for the comparison it was only .82. The problem/solution passage that participants read contained 6 signaling words in it that they could have used in their own writing. Furthermore, many other signaling words could have been used by

participants if they had knowledge of text structure. The comparison passage only had 2 signaling words in it, but there are many other comparison signaling words that could have been used if participants were familiar with text structure. Moreover, signaling words could also be used more than once throughout their recall, so scores could have been much higher. Based on these findings, it can be concluded that the majority of pre-service teachers do not use text structure strategies in their own reading and writing. Hypothesis 5 is the majority of pre-service teachers do not use many signaling words to organize their recalls. Hypothesis 6 is the majority of pre-service teachers use little detail when organizing their recalls, and hypothesis 7 is the majority of pre-service teachers do not use TLS to organize their recalls. A one-sample t test was conducted to evaluate all 3 hypotheses. The tests were all significant ($p < .01$), which suggests that the numbers found for each are not random.

One implication that can be made from this study is that pre-service teachers need to be better prepared to use text structure in their teacher education courses. The results of this study suggest that it is important that pre-service teachers begin learning about this in their college classrooms before they graduate; They cannot be expected to teach their students how to use this strategy if they do not use it and especially if they do not have sufficient knowledge of what it is. The results of this study indicate a substantial lack of awareness of text structure. One implication is that their preparation to become teachers is leaving this important strategy out. They must be aware of how to use text structure on their own, and how to teach it to others, before they are expected to teach it to students. Based on the information collected in this research study, it can be concluded that participants in this study had a lack of knowledge of text structure strategy.

LIMITATIONS TO THE STUDY

This study reviewed only two of the five text structures that can possibly be used in the structure strategy. Therefore, these results only apply to the pre-service teachers' use of text structure in problem/solution and comparison texts. This study also used pre-service teachers because it is more complex to try and collect this type of data with in-service teachers. Finally, these results are based on pre-service teachers' and cannot be extended to in-service teachers.

FUTURE RESEARCH

Future studies need to collect similar data with in-service teachers and possibly study the effect of teachers knowledge of text structure on student reading comprehension performance. Further research is also necessary to extend these results to other text structures like cause and effect, sequence, and description.

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WELCOME

ID#:_____ Date:_____

Thank-you for taking your time to complete this for us today. We really appreciate your work. We are conducting an experiment about different strategies that you use to read and recall information. Today you will first read a short article. Next you will write as much as you can recall from that article. After you have finished with the first article, you will then do the same for one more article. After you have finished your two recalls of the articles, you will complete a brief survey.

Thanks again for you work!

Appendix B

Assessment #1 – Problem/Solution Passage on Trusts

After you have finished reading the article below, please rip it out of the booklet and put it in the envelope provided to hide it from view before writing what you remember. We want to see how many ideas you remember and if you remember how the ideas were interrelated, so please write in sentences and paragraphs, rather than listing words.

Article #1

The need to distribute your property while at the same time avoiding court costs is taking form as one of the major financial problems that you must resolve before your death. At your death you want your estate to go to chosen survivors as you desired. As for court costs, avoid the need for a probate court to distribute your estate. Proceedings of a probate court can be expensive. Probate courts distribute legacies, devises of real property, and residuary property to the spouse, descendants, and charities through an attested will made by the deceased in testamentary capacity.

A related problem of equal magnitude is the need to avoid obstacles in the U.S. courts. These obstacles or hurdles in distributing your estate as you desire include delays in time, the management of your estate by the court, and state laws for equal distribution of your wealth. Proceedings of probate court have tied up estates for as long as six years, while the spouse lived without these funds. If you die without a will your estate is distributed to relatives equally.

The trust, a type of will substitute, holds great promise as the solutions to these problems. Trusts avoid probate court to transfer title of ownership. Trusts avoid court costs and delays. In addition, they

completely avoid payment to the government at death of gift taxes and estate taxes listed in the Economic Recovery Tax Act. Trusts enable you to control your property without legally owning it. In light of these assets of trusts, Lloyd Copenbarger, Pep Jackson, and others concerned with estate planning have systematically mounted an effort to distribute pamphlets to educate the public about trusts in the 1980s.

In establishing a trust the trustor divides the property into legal and beneficial ownerships. The property transferred into a trust is called by a special term; it is called the corpus of the trust. Legal ownership is held by the trustee and beneficial ownership is held by the beneficiary. The trustee holds the legal title and the beneficiary uses the property. The trust merely divides the legal ownership from the beneficial ownership. The trustor can change the trust with provisions of a revocable living trust. Property is distributed according to the wishes of the trustor. The trustee, such as the trustor's bank, can transfer a deceased trustor's farm, part of the trust's property, to new beneficiaries. The trustor as the former beneficiary would have had the rights to all benefits of the property, such as the income, and the right to use the property, such as live on the farm. The trustee transfers the beneficiary rights to the farm to the new beneficiaries, such as the deceased trustor's spouse and the deceased trustor's children.

It has been mentioned that trusts avoid court costs and delays. A trust does not have a "life span."

Trusts cannot die. Trusts provide transfer of property at your death to chosen individuals without court involvement. Trusts allow you to control the use of your property during your life and after your death.

Please tear out the article and place it into the envelope provided. Then, write as much as you can recall from this article on the space provided without looking back.

Go to the next page when you finish writing what you remember.

Appendix C

Assessment #2: Comparison Passage on Circles

After you have finished reading the article below, please rip it out of the booklet and put it in the envelope provided to hide it from view before writing what you remember. Please write down everything you can remember from the article. We want to see how many ideas you remember and if you remember how the ideas were interrelated, so please write in sentences and paragraphs, rather than listing words. You can use the words in the article or your own words.

Article #2

Two places in the New World display enormous stone heads that are quite different. The stone heads at Mount Rushmore are located in the Black Hills of South Dakota in the United States. Mount Rushmore has the largest figures of any statue in the world. Mount Rushmore displays the faces of four of the greatest American Presidents. These presidents, whose likenesses are preserved in stone at Mount Rushmore, are George Washington, Thomas Jefferson, Theodore Roosevelt, and Abraham Lincoln. The head of George Washington is as high as a five-story building. We know the reason for making the stone heads at Mount Rushmore, who built them, and how they were built. We know this because we have a written record of their construction and they were built recently. Work began on the stone heads at Mount Rushmore in 1927. The stone heads of the presidents were completed in 1941. They were built to help people remember these four great American Presidents. Gutzon Borglum designed and directed the work on the stone heads. The stone heads of the presidents were cut into the granite cliff of Mount Rushmore with drills and dynamite.

In contrast, Easter Island is covered with 887 stone heads. Easter Island is an isolated, barren island in the middle of the Pacific Ocean approximately 2,300 miles west of South America. The stone heads on Easter Island weigh from five tons to 70 tons. Some of the stone heads are as tall as a four-story building. Some of the stone heads also have hats of red stone that each weighs as much as two elephants. All of the stone heads on Easter Island, called maori by the islanders, have long ears, thin sneering lips, and pointy noses. We do not know why the stone heads were built on Easter Island. We also do not know who built Easter Island's stone heads or how they were built. This is a mystery because there is no written record of their creation and they were built a long time ago. The stone heads probably were built about 550 years ago. Archaeologists think the stone heads were carved with stone tools in the dead volcano crater of Rano Raraku because there are still about 397 unfinished stone heads in the crater. Somehow the finished stone heads were moved over two miles. The red rock for the hats on the stone heads appears to have come from the opposite end of the island about seven miles away from Rano Raraku. Some archaeologists think that it took several generations of islanders to build one maori stone statue. They think that the building of the stone heads on Easter Island started around 1450 A.D. Later all the stone heads were pulled down. The last stone head was pulled over in 1840 on the occasion of a cannibal feast held in one of the island's many caves. In the last fifty years some of the stone heads of Easter Island have been repaired and set up in place again. Archaeologists don't know why the stone heads were built or who built them. They also don't know why they were overturned and toppled to the ground.

Please tear out the article and place it into the envelope provided.

Survey

1. What's your gender?

Male

Female

2. What is your major?

3. What is your GPA?

4. When you read expository texts, do you identify text structures?

Yes

No

5. Please list the text structures you are familiar with:

6. What is text structure?

Please place everything in your envelope!