# THE EFFECT OF TRALE (TECHNOLOGY-RICH AUTHENTIC LEARNING ENVIRONMENTS) ON YOUNG URBAN LEARNERS' INTENTIONALITY IN WRITING

By

AGNES CAVE * FRANK R. YEKOVICH **

*-** Department of Education, The Catholic University of America.

*ABSTRACT*

*The purpose of this study was to examine the effect of TRALE (Technology-Rich Authentic Learning Environments) on children's writing development by tracing the logical sequence of how TRALE fostered goal-directed behavior and planning that resulted in initiating and maintaining cognitive components until a written product was completed. The subjects were young African-American 3rd graders in a low-performing, low SES urban public school. Student essays were analyzed using Meyer's (1975) prose analysis method applying rhetorical predicates and role relations. The multivariate and subsequent univariate tests indicated that by the end of the school year the TRALE students' essays became quantitatively and qualitatively superior (syntactically and rhetorically more coherent and complex) to products whose authors were instructed in a more traditional classroom.*

*Keywords: Literacy Instruction, Composing Processes, Writing Development, Cognition, Learning Community, At-Risk Students.*

## INTRODUCTION

Elementary students' writing development has been studied extensively (Boscolo, 2007; Chapman, 2006; Dyson, 2008; Shagoury, 2009) using various perspectives, such as developmental (Byrnes & Wasik, 2009; Graves, 1983; Harste, Woodward, & Burke, 1984; Kostelnik, Soderman, & Whiren, 2007, Morrow, 2001; Shagoury, 2009), cognitive (Flower & Hayes, 1981; Hanson, 2007; McCutchen, 2006; Scardamalia & Bereiter, 1985, 1987), social cognitive (Flower, 1994; Langer, 1987), and sociocultural (Dyson, 1984, 1993, 2008; Prior, 2006; Purcell-Gates, 1995). Researchers have described the components of writing, how they function in a complex writing system (Flower & Hayes, 1980), and how the social context and curriculum may impact children's writing (Dyson, 1989, 1997, 2008). This study examined the effect of an instructional program known as TRALE (Technology-Rich Authentic Learning Environments) on children's writing development by tracing the logical sequence of how TRALE fostered goal-directed behavior and planning that resulted in initiating and maintaining cognitive components until a successful written product was completed. As this article examines children's writing, the-next section delineates how the writing process is conceptualized and defined.

### The Writing Process

The writing process in this study is conceptualized as a written communicative act consisting of various related phases, such as planning (generating, organizing, and goal setting), translating, reviewing (evaluating, revising), and monitoring (Flower & Hayes, 1981). Each phase has its own purpose and function in this interrelated and cyclical endeavor and occurs not in a sequence of stages but in an order depending on the writer's goals, developmental level of writing skill, and metacognitive skills, thus contributing to the overall quality and quantity of the written product.

Writing instruction in TRALE is conceptualized according to principles identified by Farr and Daniels (1986): (i) The students' basic linguistic competence is appreciated and therefore expectations for student achievement in writing are high, (ii) opportunities are created to write for real, personally meaningful purposes and a wide range of audiences (Cicalese, 2003; Matsumura, Patthey-Chavez, Valdes, & Garnier, 2002), (iii) the students are familiarized

with the processes of writing including prewriting, drafting, and revising, (iv) collaborative activities provide ideas for writing and guidance for revising work in progress (Wollman-Bonilla & Werchadlo, 1999; Cicalese, 2003; Graham & Harris, 2005; Yarrow & Topping, 2001), (v) frequent one-on-one teacher conference with students is scheduled, (vi) direct instruction is provided in specific strategies and techniques for writing, (vii) teaching of writing mechanics and grammar occurs in the context of students' actual compositions rather than only in separate drills, (viii) correction focuses on sets or patterns of related errors rather than individual surface structure errors, and (ix) flexible and cumulative evaluation of student writing is used stressing revision.

The writing process is conceptualized in this study to develop in a cognitively predetermined manner; i.e., it is closely related to cognitive development and has stages that can be characterized by children's maturity and proficiency. Various models created to capture the developmental aspects of writing have identified very similar characteristics, such as scribble, letter string, beginning consonant sound representing entire word, beginning and ending consonant sounds representing entire word, adding medial consonants, vowels introduced among consonants, words written with spaces between them, capitalization and punctuation, and conventional spelling. A complex scale of writing development created by Lamme and Hysmith (1991) and adapted by Peregoy and Boyle (2001) seems to capture the development of not only spelling but also the various writing components, such as prewriting and revising. This scale characterizes emergent writing behavior as well as transitional and more mature writing behavior. According to this scale of writing development one can expect that children (i) pretend to write by using mock letters and copying words available before labeling drawings and using letters that do have some connection to sounds, (ii) write a story as a single factual statement before following the pattern of a known story with a beginning, middle, and end, and (iii) revise by adding to the story before using a variety of strategies for revision and editing. According to this scale children with more proficient writing skills are able to organize their writing more successfully - keeping in mind the purpose of their essay - than less proficient children. The complete scale is presented in Appendix A.

How does one create an environment that promotes the writing process that will produce quantitatively and qualitatively superior products? In this study two writing environments (TRALE and traditional) were compared to see how the learning conditions in both classrooms influenced the kind of knowledge children internalized, the way that knowledge was operated upon, and the type of cognitive performance demonstrated in writing. The purpose of this study was to determine whether children in the TRALE class wrote quantitatively and qualitatively superior essays compared to children who were instructed in a more traditional (control) classroom. In order to understand the kind of learning in the treatment group, TRALE is briefly described in the next section.

### The TRALE Learning Environment and Its Critical Dimensions

TRALE is an instructional framework designed to provide meaningful instruction integrating problem-based learning activities and technology in authentic learning environments in the early childhood classes (Walker & Yekovich, 1999). The authentic learning environments of TRALE are based on the concept of a classroom community, within which each child is a contributing member to the classroom role. For instance, one of the 3rd grade classes in the TRALE community is a Newsroom. Anderson, Reder, and Simon (1996) cited Singley and Anderson's (1989) demonstration to show that transfer between tasks is a function of the degree to which the tasks share cognitive elements on the deep level as opposed to the surface level. One of the assumptions of the TRALE project is that knowledge acquired and used in authentic learning environments is processed on a deeper conceptual level, is more accessible to students, can more easily be transferred, and may be retained longer (Walker and Yekovich, 1999). In authentic learning environments children presumably acquire declarative knowledge and procedural knowledge (Anderson, 1983) through "real world" problems and activities (by producing a real newspaper), and, in addition, practice components of cognitive activities separately as suggested by Anderson,

Reder, and Simon (1996). Thus, these learning environments are flexible and sensitive to students' cultural backgrounds (Dyson, 1993; Monkman, MacGillivray, & Levya, 2003), as well as their current developmental level and cognitive skills; i.e., the tasks are in the children's zone of proximal development (ZPD) (Vygotsky, 1978). As students' processing capabilities become more sophisticated, these tasks become more challenging. In these environments, technology is used as a tool in the community to aid students in executing the tasks their "jobs" require, such as editing the newspaper articles on the computer before publishing them.

Besides the Newsroom, the TRALE community consists of other classroom roles such as the Art Gallery, African Museum, Children's Theater, Post Office, General Store, Card Shop, and Poetry Club. All classroom roles are designed in order to create a learning environment where children view themselves as problem solvers, mathematicians, performers, readers, and writers. In the Newsroom the teacher encourages children to regard themselves as authors by providing them with a real audience, enough time for task completion, encouragement, and appropriate assistance. The next section focuses on the concept of intentionality as it relates to writing and how TRALE supports children's intentionality (i.e., goal-directedness) in a written product.

### Intentionality

'Intentionality' in this study is defined as the attempt to follow through a planned goal that the writer establishes (and may later even modify). A writer who demonstrates intentionality follows the overall, overarching goal and does not get 'off track' when providing additional details or discussing additional ideas related to the main idea. Displaying intentionality necessitates metacognitive processes that allow one to remember and follow goals. In other words, intentionality in this study was defined as the initiating or triggering effect of the Technology-Rich Authentic Learning Environment on children's goal-directed behavior in learning how to write. In order to have a better understanding of how the concept of intentionality is related to children's writing development; the critical dimensions of TRALE are briefly explained using Walker and Yekovich's (1999) description.

### Description of TRALE's Critical Dimensions

*Goal-Directedness* refers to the purposive nature of human thoughts and actions. Learning and interaction become effective when children are encouraged to work toward accomplishing a mutual goal. The overall organizational principle of the TRALE classroom provides the major goal that students strive to attain as individuals and as a group. Students complete their tasks by understanding and following the procedural goal-subgoal structure of problems (Anderson, 1983).

*Authenticity* refers to the learning environment in which instruction is based on children's prior knowledge and background experiences that facilitate the understanding of new concepts and the solving of new problems (The New London Group, 1996; Shaffer & Resnick, 1999; Walker & Yekovich, 1999) by (1) relating learning and instruction to the "outside world;" (2) basing the learning processes on the students' interests, intentions, commitments, and goals; and (3) considering the students' language, affective state, and sociocultural background (The New London Group, 1996). Writing in TRALE is taught as a personally relevant (The New London Group, 1996; Walker & Yekovich, 1999) "complex cultural activity" (Vygotsky, 1978, pp. 118) rather than a motor skill.

In order to understand children's cognitive development, it is crucial to be familiar with the types of interactions in the social environment in which development occurs (Vygotsky, 1987). TRALE's *Shared Responsibility* refers to the social nature of the learning process. In part, shared responsibility promotes the motivation for learning. When children understand that the successful operation of their community partially depends on their performance, they are more willing to perform the task and motivate the others to do the same (Bruning & Horn, 2000). These children become more independent and responsible because they have an ownership of the learning process. Interactions in the TRALE environment also enhance shared responsibility: peer tutoring, peer collaboration (Cicalese, 2003; Harris, Graham, Mason, & Saddler, 2002; Yarrow & Topping, 2001), and cooperative learning are the norm. Collaboration with an adult or a more competent peer in

the child's ZPD, leads to development in culturally appropriate ways and is an effective means of supporting cognitive development (Vygotsky, 1978; Witte 2005, ed. by Haas).

*Multiple Modes of Expression and Representation* allow young children, who are constrained in their understanding of concepts and the ways in which they can comprehend and communicate their ideas, to express themselves creatively. Instruction in TRALE provides multisensory opportunities for acquiring writing skills so that students can develop enriched representations of their world.

*The Use of Technology* serves four purposes. First, technology use is integrated to serve as an authentic tool in the classroom learning environments (e.g., editing newspaper articles). Second, technology is a tool for aiding in the decontextualized practice of skills. Third, technology is a motivational tool that keeps children on academic tasks for extended periods of time. Last but not least, computer skills are a competency required for success in today's world. Technology is used as a tool in the community to aid students in executing the tasks their "jobs" require.

TRALE's assumption is that it is most effective to teach skills with a social component through a combination of methods focusing both on (1) the components in individual training in order to free up cognitive resources for task completion (Anderson, Reder, & Simon, 1996) and (2) the whole task in a social context in order to increase motivation (Anderson, Reder & Simon, 1996; The New London Group, 1996; Walker & Yekovich, 1999). The TRALE project integrates Vygotsky's principles and Anderson's concepts by using cognitive apprenticeships (Brown, Collins, & Duguid, 1989), which involve practice of whole tasks as well as component skill training and allow students (novices) to learn with the help of a teacher or a more skilled peer (expert). The TRALE classroom allows children to acquire skills in a way real apprentices do, and it also provides opportunities for children to practice whole tasks in social environments as well as to automate their component skills in individual practice.

### Evidence Supporting TRALE's Critical Dimensions

The process approach of writing is used in the Newsroom, which is based on the belief that students' intrinsic motivation to write derives from their desire to communicate about their own lives, their life experiences, and interests (Temple, Nathan, Temple, & Burris, 1993). According to TRALE's critical dimension of authenticity, motivation for most writing in real life usually stems from the communication of one's ideas to a reader who will respond to the written text in a particular way. From this perspective, the teacher-reader may not be a real audience because most of the time she is unlikely to respond to the student's communicative intent (Nixon & Topping, 2001; Tamor & Bond, 1983). Even when the teacher does respond, there may be significant difference in his or her feedback based on gender and genre (Peterson & Kennedy, 2006). By having audience, children are given opportunities to learn what knowledge to share with their audience (Hayes & Bajzek, 2008) and how to meet their readers' needs (Martlew, 1986), which makes written communication purposive and goal-directed. Students need to write every day and receive responses to grasp how well they can be understood. The greatest improvement can be observed when children are allowed to write to real audiences about topics they are interested in and for which they get specific feedback. Stanton as cited by Braig (1986) pointed out that if children are given authentic purposes to write meaningfully from early on, those experiences may alter their written products structurally. Another important feature of effective writing is goal directedness (one of TRALE's critical dimensions), which in essence is the degree to which the author is able to follow up on what s/he set out to write about; i.e., intentionality.

The TRALE classroom is described based on Klein's (1985) conceptualization of the writing curriculum. First, the TRALE Newsroom is designed to create an informal setting in which children can make decisions about their own learning, e.g., they schedule themselves to various learning centers at various times during the day, make selections about the topics of the articles for the next publication, and decide how to execute the various tasks of finding interviewees, conducting the interviews, writing the articles, and editing them. The teacher is available to students for guidance, and she also provides scaffolding for those who need more assistance especially until the procedures in

the "newspaper business" are internalized. This social nature of learning is captured by TRALE's critical dimension of shared responsibility.

Second, the newspaper context allows children to realize that writing something down is not the most successful way of producing a good piece of writing. TRALE's critical dimension of authenticity supports children's talking to real journalists from the local newspaper to understand that the writing process is much more complex and time-consuming than simply writing down one's ideas in an order of retrieval from long-term memory. Children in the Newsroom do more than prewriting and planning; they brainstorm about possible topics, come up with possible interview questions, conduct the interviews themselves, take notes, and after all this preparation, they sit down to plan what they will write about and how. Once they write their articles by hand, they edit them on the computer.

Third, the newsroom provides ample situations for writing in diverse contexts, for various purposes, and for different audiences (supporting TRALE's critical dimension of multiple modes of expression and representation). The advantage of the newspaper context is that the children are encouraged to have various purposes to match the topic and readers' needs instead of being told by the teacher what purpose the piece of writing should serve.

Fourth, various forms are available for the children to explore and to experiment with in the context of the Newsroom. Since different discourse modes elicit different styles of writing, the Newsroom children have many opportunities that challenge them to use more complex forms of expression in terms of grammar, syntax, semantics, and rhetoric.

Fifth, the context of the newspaper naturally provides 'real' audience for the young authors based on TRALE's critical dimension of authenticity. Given an audience to write to, children are encouraged to move from an egocentrically centered view of reality to a more objective view where they have to consider the type of audience as well as the audience's background knowledge (Harris et al., 2002; Hayes & Bajzek, 2008).

Difference in frequency of writing between the TRALE and control classes was not obvious in this study. The students had the same amount of time for writing activities, however, it was apparent to the researcher/ observer in both classes that the same amount of time was used in a very different way. Some children in the control class needed much more time to "get down to work" just to get in the "mood" of writing. Because they seemed to perceive their writing activities to be imposed on them, some seemed to resist writing. The control group children wanted to be "good students" and were eager or less eager to please the data collector or the teacher. In the control class the researcher could rarely observe the internal driving force, the "urge to write" that was so clear in the TRALE classroom. The Newsroom children's enhanced desire to communicate can be attributed to TRALE's critical dimension of goal directedness; more specifically, the goal of publishing the paper, the "kids' newspaper" containing articles that *the children* wanted to talk about, events *they* participated in, experiences *they* had. Upon entering the TRALE classroom, one could see real involvement and personal immersion in the all-encompassing Newsroom.

Writing instruction in the Newsroom was qualitatively different from that in the control class. Based on Klein's (1985) list of attributes of a quality composition program, writing instruction in the Newsroom was an integral part of the total program during the day and the week, it maintained a balance between fluency development and skill practice as well as its attention to all the components of writing. Writing in the Newsroom was taught through cognitive apprenticeship rather than being simply assigned, and it attended to both content and form. During and after the writing process children were always encouraged to share their writing with their peers as part of the publishing process. This peer collaboration besides the regular writing conferences may also have contributed to better written products (Temple et al., 1993).

The nature of the instructional environment makes a significant difference in how children acquire and represent knowledge. For instance, according to the TRALE philosophy, children's prior knowledge, however different it may be from what is valued in schools, should be valued and used as a foundation for further learning. Instruction must rely on children's prior knowledge (Sulzby, 1986) and

should be the starting point in learning. According to one of TRALE's critical dimensions, Multiple Modes of Expression and Representation, learning has to take place in modes and forms that are meaningful for *all* children and must consider the various modes of expression and representation that each child has. Also in this instructional environment children create different goals, have different intentions, and go through different learning experiences that influence their text (Martlew, 1986). Because of this significant difference between the TRALE and traditional classes regarding goal-directedness or the lack thereof, it was assumed in this study that the TRALE children represented writing and all its attributes in a more meaningful way that resulted in better, quantitatively and qualitatively superior pieces of writing.

When comparing oral and written discourse, Vygotsky (1962) states that written language acquisition is much more different from that of oral language because writing is more abstract and response to it may be delayed. Regarding the difference between oral and written language acquisition, Martlew (1986) asserts that it is more challenging for a child to maintain a self-cueing process relying on own resources because the reader as opposed to the listener cannot supply any immediate feedback due to the nature of the interaction. Thus, many children may find that they do not have sufficient content to write about. However, Bereiter and Scardamalia as cited by Martlew (1986) claim that external aides such as a teacher's encouragement can prompt children to continue writing. One of the assumptions of this study was that the goal-directed nature of the TRALE classroom supports the writing activity by providing external aides (such as previous newspaper editions, journalists' job descriptions, possible interview questions, flow charts of the writing process, and various heuristic devices for writers' block) as well as the goals the children create for themselves. The end result of the activity, i.e., the published newspaper is the goal that all the children strive for. However, the process of writing in a TRALE classroom is just as important as the end product. Instruction in the TRALE classroom is such that each cognitive process of writing is addressed and abundant opportunities for practice are provided for the children while they go through the various stages of newspaper publishing from brainstorming about possible topics through interviewing to layout.

Gundlach (1983) believes that if children participate in an authentic language community, write on a regular basis, and are able to communicate meaningfully with real people through reading and writing, they may develop a better understanding of what writing is for and how to use it in a more sophisticated manner.

In sum, the Newsroom functions as an authentic learning environment rich in technology and writing opportunities. Since the children can write to an audience that is genuinely interested in their articles, and the children also realize the overall importance of meaningful communication of ideas over writing mechanics, they are willing to take risks and explore new forms of writing. Every attempt they make is welcomed and praised. Because the children in the TRALE classroom can write about things they are interested in and are related to their own lives and experiences, and most importantly, they can select their topics, their motivation to express themselves remains high (Temple et al., 1993). The children take an active role in every aspect of the writing process including the feared revision because if they care about what they write about, they realize that revision is necessary to make the piece more logical and clearer to understand. Eventually, more mature writers engage in revision focusing on much more complex edits than surface accuracy and are able to verbalize their alterations (Myhill & Jones, 2007).

### Writing Instruction in TRALE and the Control Groups

Both third grade classes had the same daily schedule, number of specials, number of computers, learning centers, and number of books. The teachers in the treatment and control classes even had their planning periods at the same time. The only difference between the TRALE and control classes was the *type* of instruction. The TRALE children participated in authentic writing activities (taking notes, conducting interviews, etc.) with the goal of publishing the school's newspaper whereas the students in the control class received traditional writing instruction with little or no freedom to select the topics to write about or the strategies to complete the task.

Writing instruction in the Newsroom was integrated with

everyday school life. The Newsroom students were involved in every stage of publishing the newspaper from brainstorming about possible topics to the final layout of the paper. Most of the writing activities during the morning language block were related to the newspaper. Some of the activities included going around the school building story searching, discussing and selecting potential story topics as well as people to be interviewed, creating story boards, assigning stories among themselves, collecting possible questions to be asked at the interviews, setting up interview times, conducting interviews, taking notes, writing stories using their notes taken during the interview, typing up their articles on the computer, editing the drafts individually and in peer groups, finding clip arts, sizing the stories for the newspaper boards, and calling the editor of the local newspaper to inform him about the status of the boards.

Writing instruction in the control class was provided in a traditional method. Children were asked by the teacher to write an essay about a teacher selected topic every morning and submit it to her for correction. The writing activities during the morning language arts block were related to the themes in the children's Houghton-Mifflin reading series or to the monthly theme observed by the school. Having been told the title, the children were encouraged to sit down and start writing. Once the children finished writing, the first draft was submitted to the teacher. The children often received limited feedback about their written products. If the essays were returned to the children, most corrections were made in the area of conventions, such as spelling, grammar, and punctuation.

This study was conducted to test six hypotheses regarding quantitative (essay and sentence length) and qualitative (syntactic and rhetoric coherence) differences in children's essays. It was hypothesized that the TRALE children would produce more syntactically and rhetorically coherent essays than the control children due to the unique learning experiences in the TRALE classroom. The TRALE classroom fostered children's intent to express themselves using goals and subgoals. If the children made a plan and sustained it throughout the task by following that goal-subgoal structure until the task was completed, they were considered to demonstrate globally coherent behavior. Sustaining this goal-directed behavior is very important because less capable writers can have local coherence without global coherence resulting in a product in which each idea leads to the next, but the chain of thought gets off track with respect to the overall goal structure of the task.

The reasons for the hypotheses about the qualitative differences between the two classes were numerous. First, by practicing writing in the various types of genres for the newspaper, the TRALE children became more sensitive to the task demands. Some of the topics of and purposes for writing in the TRALE class lent themselves to rhetorically more complex structures that the children needed to use in order to achieve their goals. The goal-directed nature of the newspaper context forced students to use more complex structures by providing explanations and reasons as evidence to support their topic sentences. Second, the TRALE Newsroom by design provided more opportunities for children to maintain their audience awareness. Third, instruction in the TRALE classroom, in accordance with the educational philosophy of the TRALE model, provided children with opportunities for multiple modes of expression and representation. Thus everyone, including reluctant writers, was encouraged to begin to express herself by drawing, writing, or using the computer.

The differences in performance in the TRALE and control classes was hypothesized to exist in the areas identified in the six dependent variables of the study. In order to examine whether the hypotheses were correct, Meyer's (1975) prose analysis method was used in this study as the method of analysis.

### Meyer's Prose Analysis: A Method for Determining Quantitative and Qualitative Differences

During the long history of writing assessment, various aspects of the written products have been evaluated, such as orthography and vocabulary; grammatical systems including tense, agreement, and pluralization; mechanics of spelling, punctuation, and capitalization; discourse features, such as topic sentences, syntax, vocabulary, and sentence structure just to name a few. Since this study examined syntactic and rhetoric features of children's essays, the evaluation of punctuation, spelling, grammar, and other indicators of surface structure were not

examined.

Meyer's prose analysis method (1975) was chosen as the means of analysis because of this study's focus on organizational, paragraph-level thinking that can be captured by studying the deep structure of the text instead of its surface characteristics. This method helped measure whether the children's essays supported the hypotheses about qualitative and quantitative differences.

Meyer's prose analysis method is unique because it has the capability of providing a detailed analysis of students' writing on macro and micro levels simultaneously in every genre by tracking how elaborate the students' writing skills are; for instance, whether they give reasons for their decisions, whether they elaborate various choices or only list them, and how effectively they use certain rhetorical structures. Meyer's method allows for tracking the goal-subgoal structure of essays by examining their rhetorical predicates and role relations as well as their locations in the content structures of the essays. This method reveals what kind of goal the students have at the beginning and whether they sustain that same overall goal as they address the subgoals.

Meyer's prose analysis method is based on relations that examine connections among ideas on both the sentence level (role relations) and discourse level (rhetorical predicates). Role relations indicate how words are related within sentences whereas rhetorical predicates and their locations in the content structure delineate the beginning and end of an author's train of thought within and across paragraphs. With the help of the tree structure analysis method created by Meyer (1975) one can determine whether students are able to remember the main goal of the essay and achieve it by following through. The assumption here is that good writers have the cognitive processing capability to keep in mind the overall organizational device (rhetorical predicate) that ties the essay together and gives "direction" to it while attending to the various processes of writing. For instance, if good writers decide to give a detailed description of something and in the meantime modify their plans to describe a less important detail, they still return to complete discussing or describing the important idea they began, thus they stay "on track."

The scoring procedure within Meyer's analysis created in this study gave a higher score to those children who followed the overall goal and did not get off the path. Meyer focused on rhetorical predicates and because they are goal-directed, her prose analysis can track if children had a top level goal, what that goal was, if the children sustained that goal throughout the task resulting in a more cohesive written product, and where the children's ideas were located in the content structure of the essay. The dependent variables of this study were designed to obtain this information.

## Methods

### *Participants*

Forty-nine urban African-American 3rd graders with high risk of educational failure participated in the study. Initially the treatment class housed 25 children, and the control group had 24 students. The children were randomly assigned to two 3rd grade classrooms upon entering school. However, a few weeks after the school year had begun, several students were transferred to the treatment class due to disciplinary problems in the control class, and others transferred out of the school. As a result, more low achieving students with behavior problems became enrolled in the treatment class. The final n's in the study were 20 in the TRALE class and 17 in the control class.

### *Design*

A pre-test-treatment-post-test design was employed in this study. The experimental design of this study was a 2x7 mixed factorial with repeated measures on the month variable. This study had two independent variables: (i) the type of learning environment with two levels (authentic, traditional) and (ii) month with seven levels (December-June). The six dependent variables were the scores that described the content structure of each essay: (i) number of relations and rhetorical predicates as the indicator of essay length, (ii) number of relations as a measure of length within each sentence, (iii) number of rhetorical predicates as a measure of relations among sentences in each essay, (iv) number of rhetorical predicates high in the content structure as a measure of top level organization of each essay, (v) number of complex rhetorical predicates as a

measure of complexity, and finally (vi) number of complex rhetorical predicates high in the content structure as a measure of top level organization in terms of complex rhetorical predicates (i.e., a measure of intentionality).

*Materials*

The students were given a pencil and two lined sheets of paper on which to write each of their essays. The sheets were the same as the ones they used every day during the language arts block. The essays were all handwritten. The children were not asked to draw any pictures but could do so. The theme of each prompt was related to the holiday of that particular month. The holidays observed throughout the country were themes in the children's Houghton-Mifflin reading series, and each class celebrated these holidays throughout the school. For instance, the prompt in December was related to Christmas: "If you had a magic reindeer that can make all your dreams come true, what kind of Christmas would you like to have?" See a list of prompts in Appendix B.

*Procedure*

Data collection was conducted in the following manner. Children in the two classes wrote their essays at their own desks. The writing activity occurred during the morning language arts block under the researcher's supervision. This writing activity was the first one during the school day in both classrooms. Teachers could choose to give their students another writing assignments on that day after data collection but not prior to that. All the children were given the same prompt and standardized instructions:

> *Good morning, Boys and Girls. This morning you will write your essay just like every morning. I will give you a pencil and two sheets of paper. On the first sheet you can see the title of your essay. You will write your name, the date, and the essay on the second sheet, which is lined. If you want to write a long story, I will give you as many sheets as you need. After you read the title and before you start writing, please think about all the things you want to say. If you want, you can also write a plan or a list of the things you want to write about before you write your essay. Please write down everything that you think about. Do not worry about spelling. If you do not know how to spell a word, just "sound it out" as you usually do in class. You will have an hour to write your essay. While you are writing, please concentrate on your own essay. Do not discuss your ideas or spelling with other children. We would like to know what you can write on your own. When you finish writing, you will have 10 minutes to go over what you wrote and make changes if you want to. After you give me your essay, I will keep it, and you will not be a b l e to change anything else. If you finish early, first r e a d your essay before you give it to me and then you can work from your folder or read a book in the library quietly.*

The prompt was read out loud, typed on a separate piece of paper, and distributed to each child. Unfamiliar vocabulary was explained. Children were reminded to write down everything they could about the topic, edit their written products, and focus on the content of their essays rather than on spelling. If children experienced a "writer's block," the researcher encouraged them to go on, but no ideas were suggested. The children in both classes usually needed 40-50 minutes on average to complete their task. If children finished writing and editing their essays before time was called, they could turn in their essays and continue working quietly on other tasks. The essays were not returned to the children for further editing once the products were submitted. Those children who were absent during data collection were given their prompts by the researcher on another day during a morning language arts block, and they wrote their essays under the researcher's supervision.

Method of Analysis

This study followed Meyer's method of prose analysis (1975) by locating each content word in an essay. Once a central idea was identified in the hierarchical structure of ideas and placed at the top of a tree structure, other ideas describing this central idea were placed at lower levels in the structure. These tree structures included two types of labels: (I) role relations to label how lexical predicates related to their arguments and (ii) rhetorical relations to signal how bigger segments of text were connected (indicators of the essay's overall organization). See Appendix C for a sample of tree structures.

Meyer's rhetorical predicates were further categorized as complex (e.g., conditional) with a score of 2, and simple (e.g. collection) with a score of 1 to refer to the degree of complexity of structures in the children's written products. These distinctions between simple and complex rhetorical predicates were made by the first author and one of the Principal Investigators of the TRALE project based on developmental characteristics of children's writing. For instance, since children are able to provide early on a list of elements related in some unspecified manner, the rhetorical predicate called collection was categorized as simple as opposed to the rhetorical predicate called explanation, which fewer children (with more proficient writing skills) used in order to explain previously stated information in a more abstract manner. See Appendix D for rhetorical predicates, their descriptions (Meyer, 1975), and their scores in the content structure. Interrater reliability for categorizing the rhetorical predicates and using the point system was established at 99%. Each child's essays were scored on the basis of relations and rhetorical predicates using six measures that were the dependent variables of the study.

### Results

Results are shown in 2 sections:

(I) the analysis to determine the initial similarities of the TRALE and the control classes and

(ii) the main analysis of the data to determine whether the TRALE instructional methodology produced a statistically significant difference between the treatment and control classes by the end of the school year.

### Analysis on the Initial Equality of the TRALE and Control Classes

By using random samples for spelling patterns in both classes it was concluded that students experienced small to moderate difficulties in spelling in both classes,and in each class there was an equal number of students who had great challenges in terms of spelling. This analysis was important in order to see if children in the two classes were allocating approximately the same number of cognitive resources to spelling.

Data were collected at the beginning of the school year on a random sample of children in both classrooms. The sample sizes in the analysis were unequal in the two classrooms due to the children's irregular attendance in both classes. Thus 9 children were tested in the control class and 15 in the TRALE class in the month of October. The children in both classes were asked to write to the same prompt.

Table 1 presents the means, standard deviations, and probability levels of each dependent variable in the two classes in October. The TRALE and control classes' performances on the six dependent variables did not show any statistically significant differences during the pilot study in the month of October. The October data were not included in the study's overall analyses due to the small sample sizes in both classes.

### Main Analysis of the Data

Table 2 presents the means and standard deviations of the six dependent variables in both the TRALE and control classes for the 7-month period. Due to multiple variables, a correlational analysis was conducted to determine whether a multivariate analysis of variance was substantiated in the main analysis of the data. Because a 42x42 intercorrelation matrix would not have been useful for interpretive purposes (e.g., it was not meaningful to examine how the number of relations as a measure of

| | N | Number of Relations and Rhetorical Predicates | Number of Relations | Number of Rhetorical Predicates | Number of Rhetorical Predicates High in the Structure | Number of Complex Rhetorical Predicates | Number of Complex Rhetorical Predicates High in the Structure |
|---|---|---|---|---|---|---|---|
| TRALE | 15 | 15.93 (6.68) | 8.26 (3.59) | 7.66 (3.86) | 5.13 (2.77) | 3.46 (1.95) | 2.26 (.79) |
| Control | 9 | 13.55 (5.38) | 6.55 (3.39) | 7.00 (3.46) | 6.77 (3.45) | 2.33 (1.50) | 2.33 (1.50) |
| Sig. (2 -tailed) | | p<.376 | p<.262 | p<.675 | p<.213 | p<.151 | p<.888 |

Table 1. M, (SD), and p for TRALE (in Bold) and Control Classes on the 6 Dependent Variables in the Pilot Study in October

| | N | Number of Relations and Rhetorical Predicates | Number of Relations | Number of Rhetorical Predicates | Number of Rhetorical Predicates High in the Structure | Number of Complex Rhetorical Predicates | Number of Complex Rhetorical Predicates High in the Structure |
|---|---|---|---|---|---|---|---|
| December | 20 | 20.52 (12.98) | 10.72 (7.37) | 9.80 (5.61) | 8.92 (4.75) | 9.60 (4.04) | 5.40 (3.29) |
| | 17 | 15.07 (17.36) | 7.90 (9.63) | 7.17 (7.73) | 5.78 (6.06) | 4.04 (4.74) | 3.26 (3.54) |
| January | 20 | 16.28 (10.92) | 9.70 (6.48) | 6.58 (4.44) | 4.83 (3.27) | 3.16 (2.85) | 2.58 (2.20) |
| | 17 | 10.37 (6.83) | 5.76 (3.75) | 4.61 (3.08) | 3.76 (2.44) | 2.47 (2.04) | 2.09 (1.64) |
| February | 20 | 16.60 (9.03) | 11.00 (5.76) | 5.60 (3.27) | 4.60 (2.78) | 1.80 (1.52) | 1.36 (1.41) |
| | 17 | 11.26 (10.08) | 8.13 (6.64) | 3.13 (3.44) | 2.56 (2.57) | 1.13 (1.63) | .91 (1.34) |
| March | 20 | 18.48 (16.38) | 8.08 (7.38) | 10.40 (9.00) | 8.24 (6.18) | 4.32 (5.02) | 3.24 (3.60) |
| | 17 | 9.07 (5.87) | 4.34 (2.80) | 4.73 (3.07) | 3.78 (2.37) | 1.91 (1.80) | 1.26 (1.17) |
| April | 20 | 21.72 (14.68) | 10.12 (6.94) | 11.60 (7.74) | 7.80 (6.48) | 6.44 (4.07) | 4.40 (3.34) |
| | 17 | 10.51 (6.09) | 5.91 (3.32) | 4.60 (2.77) | 3.26 (1.93) | 2.65 (1.87) | 1.95 (1.26) |
| May | 20 | 20.85 (10.57) | 10.19 (5.74) | 10.66 (4.83) | 9.57 (4.63) | 4.76 (3.08) | 4.42 (3.02) |
| | 17 | 15.17 (13.38) | 8.39 (6.66) | 6.78 (6.72) | 5.39 (5.67) | 2.43 (2.19) | 2.04 (1.66) |
| June | 20 | 28.83 (16.06) | 11.58 (6.61) | 17.25 (9.45) | 13.50 (8.87) | 7.08 (4.82) | 5.00 (3.95) |
| | 17 | 13.23 (13.53) | 5.57 (6.66) | 7.66 (6.87) | 5.90 (4.84) | 2.09 (2.27) | 1.47 (1.74) |

Table 2: M and (SD) for the 6 Dependent Variables from December to June in the TRALE (in Bold) and Control Classes

sentence length in January was correlated with the number of complex rhetorical predicates as a measure of complexity in December), a simpler correlational approach was used in which the six dependent variables for each month were intercorrelated, and it was repeated for each month. All 6 dependent variables were highly correlated with one another within each month; in all cases the Pearson correlation coefficient was statistically significant.

The data were analyzed using a mixed two-factorial MANOVA. The two factors were type of learning environment with 2 levels (TRALE, control) and month with 7 levels (December-June). The month variable was a repeated measure. Table 3 presents the results of the MANOVA analysis.

The MANOVA resulted in 2 overall significant multivariate F ratios for both main effects. The test of the between-subjects variable indicated that children in the TRALE class outperformed the children in the control class, multivariate $F(6, 30) = 2.824$, $p<.027$. The test of the within-subjects factor indicated a change in performance over the 7-month period, $F(36, 1260) = 5.463$, $p<.000$. The teacher by month interaction was not significant, $F(1260, 1260) = 1.125$, $p<.281$.

| Source | *Hypothesis df* | *Error df* | *F* | *p* |
|---|---|---|---|---|
| Teacher | 6 | 30 | 2.824* | .027 |
| Month | 36 | 1260 | 5.463** | .000 |
| Teacher x Month Interaction | 1260 | 1260 | 1.125 | .281 |

Table 3: The MANOVA Source Table

Based on significant results of the multivariate test, six univariate tests were performed in order to test separately the six dependent variables of the study. These dependent variables examined the main effects of essay length, level of organization, complexity, and intentionality between the TRALE and control classes during a 7-month period. The 2-factor univariate tests (1-between and 1-within) from the MANOVA analysis provided the following results regarding the six dependent variables. (See Table 4 for the source tables of the six univariate ANOVAs.)

First, all essays were scored for the number of relations and rhetorical predicates in order to determine essay length. As predicted, results showed that the students in the TRALE Newsroom produced longer essays than the children in the control class. Further, this pattern held for all 7 months of the study. The F-ratios for both teacher and month main effects were significant, $F(1, 35) = 6.601$, $p<.015$ for the teacher variable and $F(6, 210) = 3.762$, $p<.001$ for month. The interaction of teacher by month was not significant $F(6, 210) = 1.468$, $p<.190$.

Second, all essays were scored for the number of relations to determine sentence length. As predicted, the results showed that the TRALE students wrote longer sentences

| Source | df | MS | F | p |
|---|---|---|---|---|
| Number of Relations and Rhetorical Predicates | 6, 210 | 281.457 | 3.762 | .001 |
| Number of Relations | 6, 210 | 73.758 | 3.031 | .007 |
| Number of Rhetorical Predicates | 6, 210 | 231.120 | 10.982 | .000 |
| Number of Rhetorical Predicates High in the Structure | 6, 210 | 156.488 | 10.269 | .000 |
| Number of Complex Rhetorical Predicates | 6, 210 | 142.089 | 3.495 | .003 |
| Number of Complex Rhetorical Predicates High in the Structure | 6, 210 | 44.888 | 9.313 | .000 |

Table 4(a). Source Table for the Month Main Effect

| Source | df | MS | F | p |
|---|---|---|---|---|
| Number of Relations and Rhetorical Predicates | 1, 35 | 3444.041 | 6.601 | .015 |
| Number of Relations | 1, 35 | 567.463 | 4.087 | .05 |
| Number of Rhetorical Predicates | 1, 35 | 1136.952 | 9.062 | .005 |
| Number of Rhetorical Predicates High in the Structure | 1, 35 | 765.247 | 10.831 | .002 |
| Number of Complex Rhetorical Predicates | 1, 35 | 504.605 | 6.932 | .013 |
| Number of Complex Rhetorical Predicates High in the Structure | 1, 35 | 182.513 | 9.903 | .003 |

Table 4(b).Source Table for the Teacher Main Effect

| Source | df | MS | F | p |
|---|---|---|---|---|
| Number of Relations and Rhetorical Predicates | 6, 210 | 109.871 | 1.468 | .190 |
| Number of Relations | 6, 210 | 18.298 | .752 | .608 |
| Number of Rhetorical Predicates | 6, 210 | 56.634 | 2.691 | .015 |
| Number of Rhetorical Predicates High in the Structure | 6, 210 | 25.574 | 1.678 | .128 |
| Number of Complex Rhetorical Predicates | 6, 210 | 33.906 | .834 | .545 |
| Number of Complex Rhetorical Predicates High in the Structure | 6, 210 | 6.795 | 1.410 | .212 |

Table 4(c).Source Table for the Teacher x Month Interaction

than their peers in the control class did. This pattern held for all 7 months. The F-ratios for both teacher and month main effects were significant, $F(1, 35) = 4.087$, $p<.05$ for the teacher variable and $F(6, 210) = 3.031$, $p<.007$ for month. The interaction of teacher by month was not significant $F(6, 210) = .752$, $p<.608$.

Third, the essays were also scored for number of rhetorical predicates in order to examine whether the children in the TRALE Newsroom wrote more organized essays than the control children. For instance, if a child only listed a few items, the child used only one rhetorical predicate called collection. If the same child also designated time or location in his or her text, the essay received additional points for setting time or setting location. The F-ratios for both teacher and month main effects were significant, $F(1, 35) = 9.062$, $p<.005$ for the teacher variable and $F(6, 210) = 10.982$, $p<.000$ for month. The interaction of teacher by month was significant $F(6, 210) = 2.691$, $p<.015$). Because of the significant interaction of teacher and month on this variable, a simple effects analysis was conducted in order to examine thoroughly the nature of the interaction (Keppel, 1991). The results of the simple effects analysis indicated that even though the TRALE group's means were consistently higher across each month, the difference between the means were significantly bigger in April $F(1,35) = 5.06$, $p<.05$ and in June $F(1,35) = 9.87$, $p<.05$ than in the other months. Thus the results showed that the TRALE children wrote more organized essays than the children in the control class, and this pattern held across all 7 months.

Fourth, all essays were scored for rhetorical predicates high in the content structure in order to examine whether the more important ideas (high in the structure) as opposed to less important ideas (lower in the structure) were elaborated upon. For instance, a child received more points for explaining, describing, or characterizing a more important idea (on a higher level) as opposed to an insignificant detail in the text (on a lower level). Children who kept the goal-directed nature of the writing task in mind held the overall goal in sight and thus were able to use ideas to describe important details. Even though the TRALE children provided information on lower levels, they did not lose their focus and were more apt at organizing their ideas on a global level. This pattern held across all 7 months. The F-ratios for both teacher and month main effects were significant, $F(1, 35) = 10.831$, $p<.002$ for the teacher variable and $F(6, 210) = 10.269$, $p<.000$ for month. The interaction of teacher by month was not significant $F(6,210) = 1.678$, $p<.128$).

Fifth, all essays were scored for the number of complex rhetorical predicates in order to examine the level of complexity of each written product, such as explaining previously stated information in a more abstract manner (explanation) as opposed to simply listing items

(collection), For instance, the Christmas essays in which children (1) specified what kind of toys they would like to get [specific], (2) explained why they would like to get those toys [explanation], or (3) described them in detail [attribution] were considered more complex than those texts in which children only listed what they would like Santa Claus to bring [collection]. As predicted, the TRALE children wrote more complex essays than the children in the control group, and this pattern held across all 7 months. The F-ratios for both teacher and month main effects were significant, $F(1, 35) = 6.932$, $p<.013$ for the teacher variable and $F(6, 210) = 3.495$, $p<.003$ for month. The interaction of teacher by month was not significant $F(6,210) = .834$, $p<.545$.

Finally, all essays were scored for the number of complex rhetorical predicates high in the structure to tap into children's intentionality through tracking how many higher complex rhetorical predicates they used. If children chose a complex rhetorical predicate at the beginning of their essays and "did not get off track," the essays demonstrated more intentionality. The assumption was that because the TRALE children were accustomed to working in an authentic environment, they had more opportunities for complex writing tasks. Since this environment was goal-directed simultaneously, the TRALE students also learned how to sustain those complex rhetorical predicates they selected at the beginning of their essays. As predicted, results showed that the TRALE children used a higher proportion of complex rhetorical predicates high in the content structure compared to all the complex rhetorical predicates in their text than the children in the control class, and this pattern held across all 7 months. The F-ratios for both teacher and month main effects were significant, $F(1, 35) = 9.903$, $p<.003$ for the teacher variable and $F(6, 210) = 9.313$, $p<.000$ for month. The interaction of teacher by month was not significant $F(6,210) = 1.140$, $p<.212$. All these above-mentioned values are included in the following three source tables for (i) month main effect, (ii) teacher main effect, and (iii) teacher x month interaction (Table 4).

Data on all six variables indicated similar patterns to the one in Figure 1 on "The Average Number of Complex Rhetorical Predicates High in the Content Structure during the 7-Month Period in the TRALE and Control Classes."

### Summary

As the results of the pilot study indicated, the students' average performance in both classes showed no statistical difference in October. This equality was not surprising because of the random selection of students into the TRALE and control classes before the school year began. The TRALE Newsroom was set up soon after the school year had begun and became fully operational during the month of November. The data collection for the main analysis began in December and by then the students had been intimately involved in TRALE's technology-rich authentic learning environment that enabled them to gain experiences and explore opportunities that were not available to the students in the control class. In order to determine whether there were any quantitative and/or qualitative differences in the two classes' essays, six dependent variables were used in the analyses. These variables, indicators of differences in the written products, confirmed the TRALE essays' superiority in the following aspects: essay and sentence length, relatedness of sentences in essay, top level organization of essay, complexity, and intentionality.

Holding all possible variables constant in this study, the only difference between the two classes was the type of learning environment and instruction that resulted from the features of the TRALE classroom and the traditional teaching methodology in the control class. Thus, it is concluded that the differences in students' written products were attributable to the TRALE learning environment.

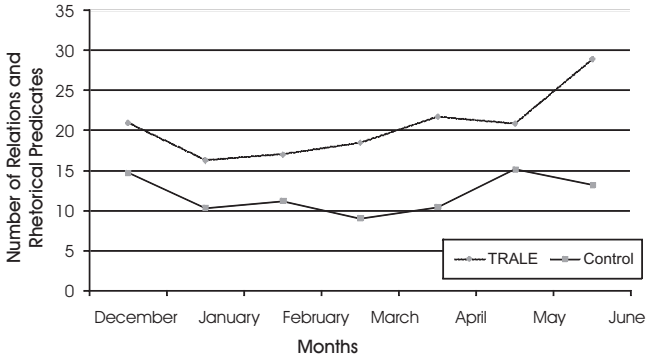


Figure 1. The average number of complex rhetorical predicates high in the content structure during the 7-month period in the TRALE and control classes.

Discussion

The data from this research were analyzed in order to answer the following questions: Compared to the control class to TRALE students.

- write longer essays in terms of number of relations and rhetorical predicates,
- write longer sentences in terms of number of relations,
- use more rhetorical predicates to better connect their sentences,
- use more rhetorical predicates high in the content structure as a top level organizational device,
- produce more complex essays in terms of number of complex rhetorical predicates, and finally
- display more intentionality in their essays in terms of using a greater number of complex rhetorical predicates high in the content structure?

The first purpose of this study was to investigate the length of essays produced in the TRALE and control classes. As predicted, the results indicated that the TRALE essays were characterized by a higher number of relations and rhetorical predicates, thus were consistently longer throughout the study than the essays in the control class.

The length of students' essays can be examined from developmental, cognitive, and social cognitive perspectives. According to all these areas of research, as children practice writing and become more skilled in it, they tend to write longer essays and longer sentences. As novice writers, most children struggle with motor skills while they translate their ideas onto paper and with practice they acquire the skills to express themselves in a more detailed fashion.

Regarding the ability to write longer essays, the cognitive point of view based on Anderson's ACT model (1983) delineates among other things how cognitive processes become more sophisticated and may also become automated with practice. In order to write, students need to draw upon both declarative and procedural knowledge. Declarative knowledge contains information about forms of letters, directionality of writing, spelling of words, sentence structure and so forth that become more elaborate as the child is exposed to more practice in writing and more diverse texts during reading. However, knowing what an essay should look like is not sufficient for creating texts; writing skills embedded in production systems from procedural knowledge are also a prerequisite. As the basic skills of translation are practiced, they become more automated and gradually require fewer cognitive resources during task execution. Because experts do not need to allocate all their attention to motor skills during writing, they are more able to produce longer texts than novices are. Thus automatization of motor skills is another explanation for children's fluency and speed during translation. The automatization of motor skills can be enhanced by more practice that children are motivated to do if they have a reason for writing. The TRALE classroom provided an authentic "minisociety" for the children to write to and converse with where the readers of the newspaper were an interactive audience.

The qualitative and quantitative differences between the TRALE and control children's essays observed in this study can be explained further using the expert vs. novice paradigm. Differences between expert and novice writers' texts may be accounted for by differences in declarative and procedural knowledge (for a detailed treatment of the topic see Gagne, Walker Yekovich, & Yekovich, 1993). In terms of declarative knowledge, expert writers tend to have a more elaborate prior knowledge about the topics they discuss. Since all children in both classes wrote about holidays and topics from their own lives, the observed differences were not assumed to be due to differences in children's prior knowledge of the topics. However, due to the different instructional methodology in the TRALE classroom, the TRALE children may have had more elaborate schemas of what writing and its various processes are and how they function in tandem. Differences in declarative as well as procedural knowledge resulting from the different instructional methodologies may have contributed to some of the observed differences between the two classes.

Children's fluency in producing longer text can also be approached from a social cognitive perspective that examines how cognitive processes are affected by the context in which the individual is placed. Graves (1983)

asserted that more favorable conditions in the learning environment support more fluent writing. Because students in the TRALE Newsroom participated in a learning environment that provided a goal for all children to achieve, they were more motivated to stay on task and express all their ideas. The TRALE Newsroom teacher familiarized her students with the component processes of writing and their functions in an integrated system. This declarative knowledge enabled students to see that it is impossible to concentrate on all aspects of writing simultaneously. The children accepted that the first draft is never perfect; it is during the revision process when the author checks the conventionality of the written piece. The Newsroom teacher continued emphasizing the importance of content over appearance in the first draft and that supported children's fluency and speed of writing by alleviating to some extent their concern for conventions. The friendly and informal environment of the Newsroom encouraged students to take risks and experiment with words when they were unfamiliar with their spelling patterns.

The second purpose of this study was to examine the length of sentences in the TRALE and control class children's essays. It was predicted that the TRALE students would write longer sentences on average than the children in the control class. As predicted, the TRALE students wrote longer sentences using more relations than the students in the control class. The ability to write longer sentences is closely related to writing longer essays. Thus, the rationalization above also applies here.

Rentel and King (1983) cited Halliday and Hasan (1976) who used cohesive ties in order to study children's stories on sentence level and how those sentences were linked. They studied cohesion by examining various modes of linking ideas together: reference, substitution, ellipsis, conjunction, and lexical cohesion. Having studied how children connected their ideas in text, Rentel and King (1983) found that children did indeed apply lexical cohesion, conjunction, and reference in order to link propositions in their writing. Using Meyer's prose analysis method (1975), the essays in this study were analyzed by considering relations such as agent, instrument, force, vehicle, patient, benefactive, latter, former, and range (see Appendix D). The TRALE students were shown to use more relations in their sentences that also happened to be longer than those written in the control class.

The third purpose of this study was to investigate the relatedness of sentences in children's essays. As predicted, results showed that the TRALE students composed better connected essays in which sentences were more successfully related to one another using rhetorical predicates. The TRALE students' better performance can be explained by referring back to Flower and Hayes's model of writing (1981) that distinguishes the components of the writing process including the monitor that is responsible for supervising (1) which component is being utilized, (2) how information from the writer's long-term memory is retrieved, translated, organized, and reviewed according to the goals the writer set, and (3) whether the original goals are being achieved. The results indicated that the TRALE students had sufficient cognitive resources to allocate to the monitor and follow their plans. The ability to monitor the direction of the essay during writing enabled the TRALE students to keep focus on what they set out to write about whereas the children in the control class were less successful in monitoring the direction of their essays.

The expert vs. novice paradigm also reveals why experts' written products reflect metacognitive processes. Since experts have more automated and elaborated writing skills, they can allocate more attention to connecting their sentences on global levels of the text. Since the TRALE Newsroom focused on both component skill acquisition and whole task, the children were encouraged and expected to consider connecting their ideas according to a logical plan to facilitate their readers' comprehension of the text.

The fourth purpose of this study was to explore the levels of organization in the children's essays in the TRALE and control classes. As predicted, results showed that the TRALE students were more successful at organizing their essays at the top level than the students in the control class by using more rhetorical predicates (simple and complex) high in the structure as a top level organizational device.

The fifth purpose of this study was to examine the complexity in both classes' essays. As predicted the TRALE

students' essays were more complex than those written by the students in the control group. Instruction in the Newsroom involved exposing children to various modes and styles of writing that incorporated both simple and more complex texts. Because the ultimate goal for all the children was to communicate meaningfully with their readers, the children were motivated to express their complex ideas in complex ways. According to TRALE's educational philosophy, the classroom environment was created in order to support learning towards expertise that included exploring language and the written form meaningfully.

The sixth purpose of this study was to examine intentionality in children's essays both in the TRALE and control classes. As predicted, the TRALE students displayed more intentionality in their essays than the students in the control class. Martlew(1986) defines effective communication as the ability to grasp and maintain an awareness of audience needs. The TRALE students had a "mission" of communicating meaningfully to a real audience. Audience awareness is closely related to intentionality since writers who display more intentionality have to select what they intend to write about, i.e., they have to choose a rhetorical predicate and must follow up on it. This "follow up" means that during the course of writing authors may modify their goals and can even go "astray" by addressing subgoals lower in the hierarchy, however, good writers return to the discussion of important ideas that were introduced earlier and complete their thought process. Those students who demonstrated a higher degree of intentionality were able to sustain a coherent discourse and organize information for their readers in a more logical and readable manner first by formulating global plans and second by moving back and forth from local to global levels during the execution of their writing tasks. The TRALE children were also more successful at switching between planning and production without losing their main global intentions (cf. Martlew, 1986), i.e., Intentionality.

The difference between the two classes could be observed in the students' attitude towards writing and in the mode of generating text. The students in the TRALE class looked more comfortable to begin and continue writing because they were repeatedly told that they first should concentrate on their ideas in their newspaper articles so that the readers can understand their train of thought. The Newsroom teacher encouraged them to postpone attending to mechanical problems (spelling and punctuation) after their first draft. On the other hand, the students in the control class may not have had the overall goal of communicating meaning to a real audience; thus they did not have the opportunity to generate global plans for their writing. In the control class, the novice writers' associative process rather than the experts' goal-directed heuristic search (Scardamalia, Bereiter, & Goelman, 1982) resulted in essays in which sentences hung loosely to one another and where many ideas were begun and remained incomplete. Instead of organizing their ideas, the novice writers kept focusing on surface problems of motor skills, spelling, and punctuation. The difference between knowledge tellers and knowledge transformers was revealed in the data analysis. It indicated that the tendency in the control class was to record information without applying any selection criteria that resulted in a writer-based prose whereas the more expert writers in the TRALE class tried to transcribe their ideas according to rhetorical and global goals they set during planning that resulted in a reader-based prose (Bryson & Scardamalia, 1991; Scardamalia & Bereiter, 1987).

### Educational Implications

Urban schools serve a more diverse student population with a disproportionate number of minority children who perform below basic according to standardized tests even if they attend good schools (Michaels & Cazden, 1986). At the beginning of the new millennium one would think that we have reached an era when all our students have equal opportunities for learning. Logic would dictate that as long as teachers teach and students learn, all children must succeed. This study has shed some light on the fact that it is not enough to be in school, be taught, and learn. It is very important *how* students learn and are taught. Even with the best intentions, teachers who apply the traditional teaching methodology that was (has been in some places) in vogue for the last couple of decades may not be able to impart knowledge and skills that students need in order to improve

their writing skills. This study introduced an innovative way of teaching young urban learners who have not had the chance to be exposed to everything that their suburban counterparts are and who have not had the opportunity to acquire as many writing skills outside of school as more fortunate children have. The results of this study indicated that the TRALE instructional methodology greatly increased and enhanced young urban learners' writing opportunities and written language performance in school.

Hampton (1995) asserts that educational opportunities for writing acquisition for children who are labeled "at risk," just like the subjects of this study, may be quite limited. Writing instruction in low performing schools often focuses on skill-based instruction exclusively, such as spelling, grammar, and handwriting. In these schools the assumption is that low performing students need to master these low level skills before they can be taught how to express themselves meaningfully and logically. This traditional writing instruction begins at the bottom of the hierarchy and plans to move upward after children have displayed some proficiency at the various levels. Several problems occur in classrooms with an educational philosophy such as this. First of all, developmentally and cognitively, it is not appropriate for children to learn writing in this order because higher-order thinking skills need to be supported from the very beginning. Even if it were developmentally appropriate to teach writing skills in this bottom-up method, by the time students would reach the stage where their spelling and grammar are improved, they would be far behind other children who had been expressing themselves meaningfully all along. Results of research studies show that this gap is almost insurmountable (Hampton, 1995). Executing decontextualized writing tasks exclusively can be detrimental to writing acquisition, not only from a cognitive point of view but also from a motivational perspective. Students who know that their ideas are important and that their essays say something powerful about their lives, experiences, and opinions, are more actively involved in writing.

The TRALE program was created to allow young urban children from low-income and low-literate backgrounds to participate in a community, more specifically in the context of the Newsroom, in order to acquire all the skills they need to be successful writers. In the TRALE Newsroom where the instructional methodology supported learning towards expertise, the children became increasingly successful in gaining expert-like writing strategies compared to the children in the control class. By participating in the sociocultural context of a highly literate, authentic learning environment, the children were given opportunities to be "enculturated" in its social practices. Sociocultural researchers emphasize the importance of valuing children's prior knowledge and their basic linguistic competence. Instruction must start where the children can make a connection with it, and instruction must focus on meaningful communication (Purcell-Gates, 1995; Wolfram, Adger, & Christian, 1998). The educational philosophy of TRALE reflects this belief.

Instruction in the TRALE classroom was successful in facilitating students' writing development because the students perceived all writing tasks, such as composing a poem, describing an event, or writing a recipe as a creative process and not just as a motor skill. Students also learned that all processes of writing are important including revision. The TRALE students edited their writing alone, in peer editing groups, and at teacher conferences on a regular basis: prior to, during, and/or after the writing act. Students were encouraged to use their personal experiences inside and outside of the TRALE community as a basis for their writing. Students were informed of the various reasons for writing and how those reasons affect form, style, and mode. Instruction also focused on how to consider audience, purpose, setting, and subject and how to modify one's writing style accordingly. The newspaper prompted students to develop an overall goal and appropriate procedures for accomplishing their writing tasks. Children were given sufficient opportunities to experience writing in a variety of composition types. Students participated in daily meaningful writing activities with sufficient time devoted to motivation, direction, and follow-up. Only after their ideas were transcribed, did students begin working on conventions of spelling, usage, and mechanics. In sum, the instructional methodology of the TRALE Newsroom encouraged children to become increasingly successful in gaining expert-like writing

strategies compared to the control class.

The TRALE classroom's success can also be attributed to its philosophy that *every* child's language development has to be fostered in the classroom. The goal-directed nature of the Newsroom with its authentic, meaning-making activities created opportunities for all children to participate regardless of their ability, to be motivated to become a member of the TRALE community, and to perform their tasks successfully. In a nurturing and instructional environment like the TRALE Newsroom, motivation to participate increased and anxiety about writing decreased because the third graders realized that difficulties in writing were a natural part of being a journalist. Instruction in the TRALE Newsroom was also flexible to meet all the writers' needs regardless of their developmental level of writing.

Vygotsky (1978) recommended that writing be taught as a cultural activity that is relevant to children's lives and thus becomes meaningful. If these communicative situations are used and exploited in an instructionally appropriate way, children feel that learning how to write is a natural part of life, not training. If children have something important to say and if writing activities provide opportunities for children to express themselves in a complex and creative way, children will learn how to write expressively rather than merely filling up a page with loosely connected words.

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APPENDIX A

Scale of Writing Development

by Peregoy, S.F., & Boyle, O.F. (2001) adapted from Lamma L., & Hysmith, C. (1991).

| | |
|---|---|
| Level 1: | Child attempts to write in scribbles or draws patterns. |
| Level 2: | Child copies words s/he sees around the room<br>Child writes mock letters, but these may not be in any conventional sequence.<br>Child pretends to write. |
| Level 3: | Child copies words s/he sees around the room.<br>Child writes letters and mock letters in a line across the page.<br>Child writes in left-to-right sequence, top to bottom of page. |
| Level 4: | Letters don't match sounds, but child can explain written message.<br>Child writes strings of letters. |
| Level 5: | Child labels or makes statement about drawings.<br>Letters have some connection to sounds.<br>Child writes lists.<br>Child separates words with pace or marker. |
| Level 6: | Child invents spellings.<br>Story is a single factual statement.<br>Message is understandable (decipherable). |
| Level 7: | Child writes the start of a story.<br>Child uses both phonics and sight strategies to spell words.<br>Child writes several short sentences.<br>Child rewrites a familiar story or follows the pattern of a known story or poem. |
| Level 8: | Child writes a story with a beginning, middle, or end.<br>Child uses different forms for several different purposes (narrative, expository, persuasive).<br>Revisions include adding to the story or piece.<br>Child uses basic punctuation purposefully and consistently. |
| Level 9: | Writing includes details, dialogue, a sense of humor, or other emotions.<br>Spelling becomes more conventional.<br>Child willingly revises. |
| Level 10: | Child willingly revises and edits.<br>Child writes creatively and imaginatively.<br>Child writes clearly. The message makes sense.<br>Child uses commas, quotation marks, and apostrophes. |
| Level 11: | Child uses a variety of strategies for revision and editing.<br>Child uses a variety of literary techniques to build suspense, create humor, etc. |

APPENDIX B

Writing Prompts

The monthly prompts along with their [visual stimuli] were the following:

Christmas in December:

If you had a magic reindeer that can make all your dreams come true, what kind of Christmas would you like to have? [a picture of Rudolph the Red - Nosed ]

Martin Luther King, Jr.'s Day in January:

How can you keep his dream alive? [A picture of Martin Luther King, Jr.]

Valentine's Day in February:

Dajuan, a 3rd grader, came to Target in January. In his new class there is a beautiful and friendly girl, named Carla. Dajuan likes her very much. They sit next to each other and always study together. They even play together on the playground. Dajuan thinks he is in love. What do you think he is planning to do on Valentine's Day to express his love for Carla? If he tells Carla that he loves her, what will Carla do? [a picture of an African American boy and girl]

Spring Break in March:

Write down what activities children can do during the Spring Break. Which one would you choose and why? [a picture of the sun, park, flowers, and birds]

Easter in April:

Pretend that Easter is your favorite holiday. Tell me why it is your favorite and why it should be everybody's. [a picture of an Easter Bunny]

Mother's Day in May:

Mothers are the most special people in the world. Describe your mother on the outside and on the inside and explain why your mother is the most wonderful person in the world. [a photo of a woman]

Summer Vacation in June:

Tell me what are the great things children can do in the summer and explain why these activities are fun. [a picture of a sunny day and a school with a "CLOSED" sign on it]

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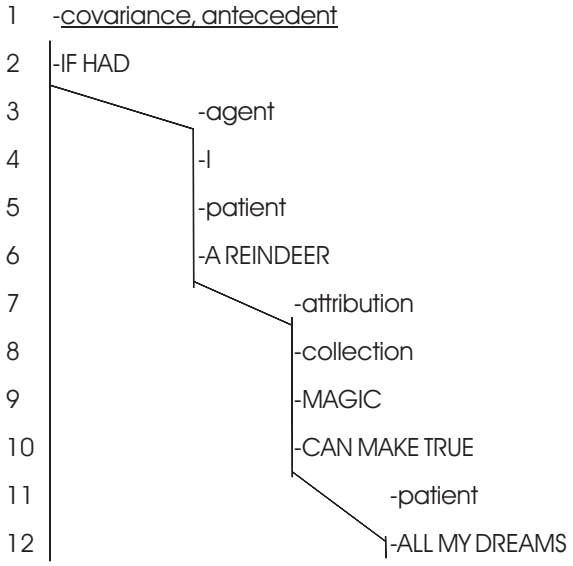
## Appendix C

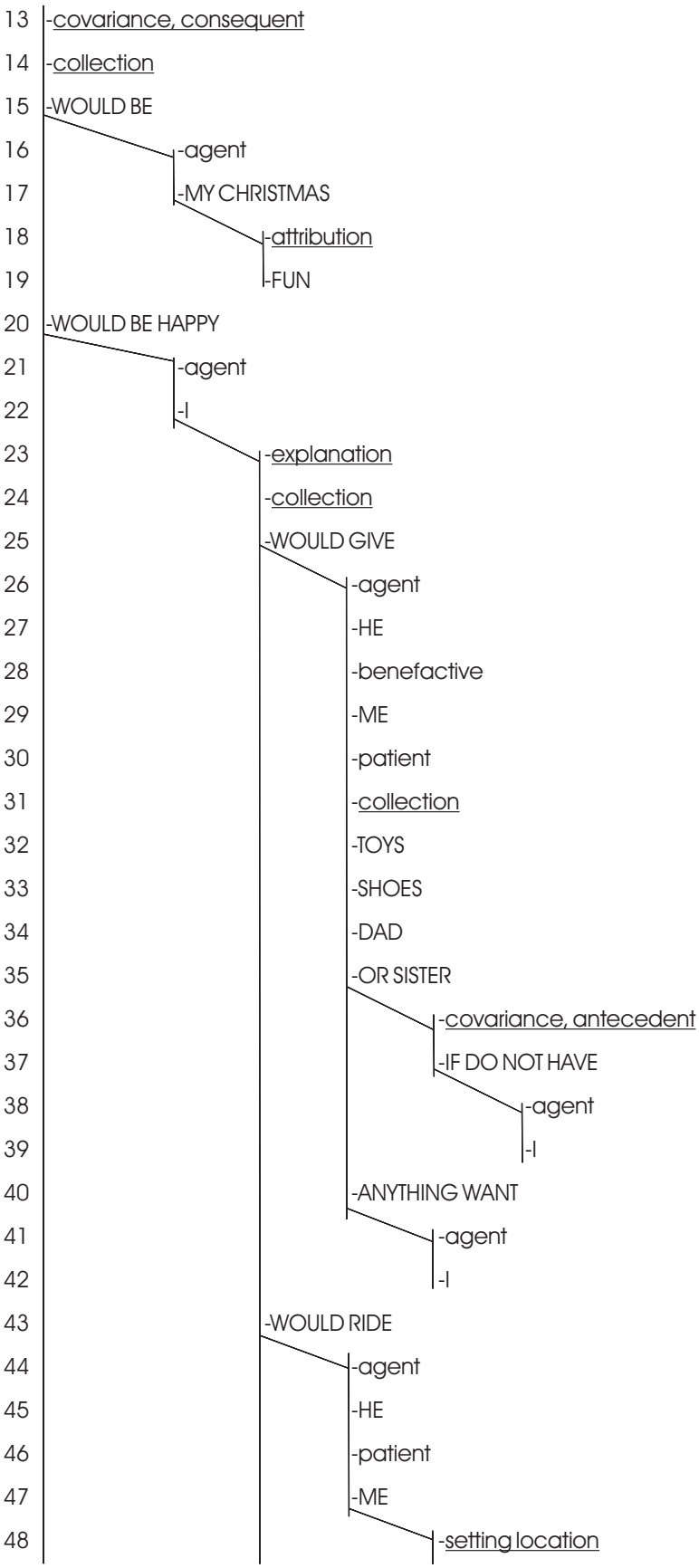
### Essays Written in the TRALE and Control Classes and Their Analysis in Form of Tree Structures

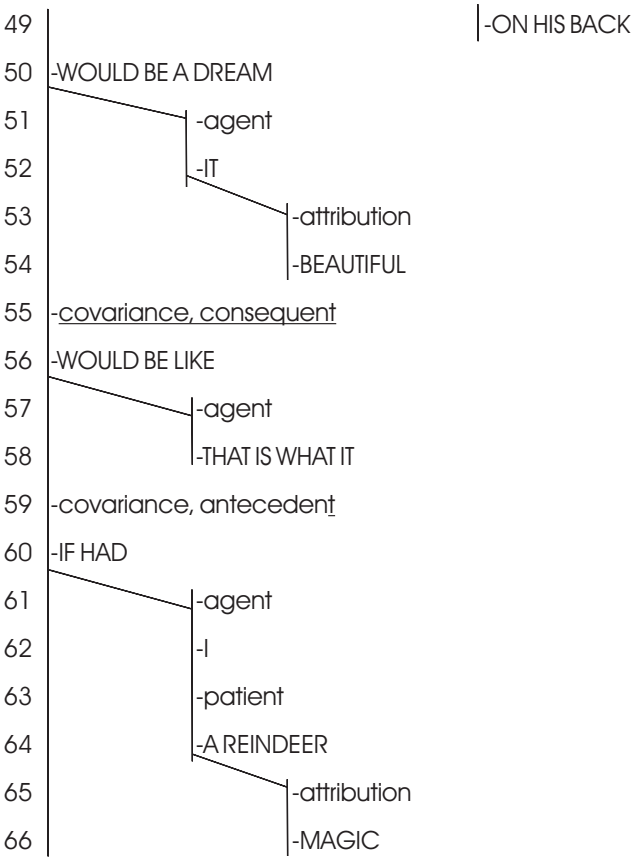
### Essay Written in the TRALE Class

If I had a magic reindeer that can make all my dreams come true, my Christmas would be fun. I would be happy became he would give my toy and he would give me shoe. He would give me anything I want. He would ride me on his back. he would give me a dad If I do not have one or a sister. it would be a beautiful dreams. That is what it would be like if I had a magic reindeer. THE END □

Content Structure of the TRALE Essay




13 -covariance, consequent
14 -collection
15 -WOULD BE
16 -agent
17 -MY CHRISTMAS
18 -attribution
19 -FUN
20 -WOULD BE HAPPY
21 -agent
22 -I
23 -explanation
24 -collection
25 -WOULD GIVE
26 -agent
27 -HE
28 -benefactive
29 -ME
30 -patient
31 -collection
32 -TOYS
33 -SHOES
34 -DAD
35 -OR SISTER
36 -covariance, antecedent
37 -IF DO NOT HAVE
38 -agent
39 -I
40 -ANYTHING WANT
41 -agent
42 -I
43 -WOULD RIDE
44 -agent
45 -HE
46 -patient
47 -ME
48 -setting location




KEY

CAPITALIZED WORDS = CONTENT WORDS FROM THE TEXT

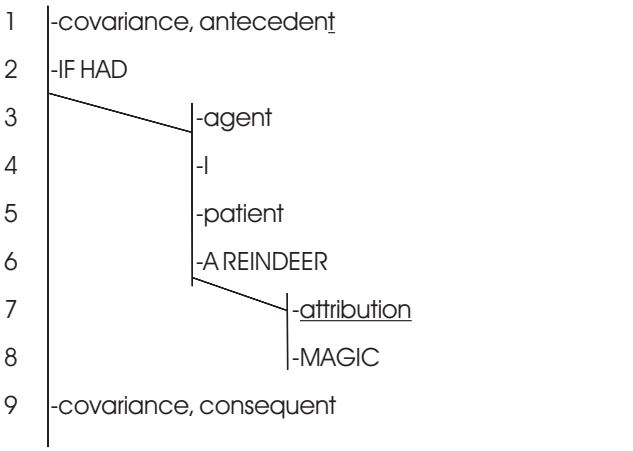
lower case words = roles

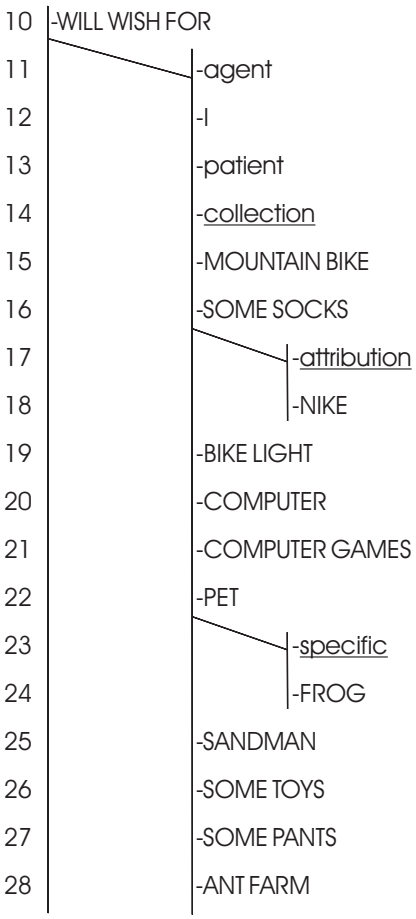
underlined, lower case words = rhetorical predicates

**Essay Written in the Control Class**

If I had a magic reindeer I will wishes for a maten bike and some soxs. I will get a key bord. I want a bike light. I want some nike soas and a computer and some game to go with it. I want a frog for a pet and a sand man. Some toys. Some pants and a ant farm.

Content Structure of the Control Essay






APPENDIX D

Rhetorical Predicates, Their Descriptions, (Meyer, 1975) and Their Scores in the Content Structure

| Paratactic Rhetorical | Description | Score |
|---|---|---|
| Predicates | | |
| Alternative | Equal weighted alternative options | 1 |
| Response | Equal weighted Question(s) and Answer(s), Remark and Reply, or Problem(s) and Solution(s) | 2 |
| Hypotactic Rhetorical | Description | |
| Predicates | | |
| Attribution | Describes qualities of a proposition | 2 |
| Equivalent | Restates same information in a different way | 2 |
| Specific | Gives more specific information about something that was stated in a general manner | 2 |
| Explanation | Previously stated information is explained in a more abstract manner (e.g., Relating the information to a general principle) or more concrete manner | 2 |
| Evidence | Evidence through perception of a situation to support some idea | 2 |
| Analogy | Analogy given to support an idea | 2 |

| | | |
|---|---|---|
| Manner | Way an event or event complex is performed (example: slowly, carefully) | 1 |
| Adversative | Relates what did not happen to what did happen | 2 |
| Setting Time | Gives time of setting in which information being related occurs (often in narratives) | 1 |
| Setting Location | Gives location of setting in which information begin related occurs (used particularly in narratives) | 1 |
| Setting Trajectory | Gives changing background of location and time that occurs in a narrative when characters travel through various places | 1 |
| Representative | Singles out one element of a group and makes it stand for the group as a whole | 1 |
| Identification | One thing standing for something else | 1 |
| Replacement | Identifies a part in relation to some whole | 1 |
| Identification | | |
| Constituency | | |
| Identification | | |
| Neutral Rhetorical | | |
| Predicates | Description | |
| Collection | List of elements related in some unspecified manner | 1 |
| Covariance | Relation often referred to as condition, result, or purpose with one argument serving as the Antecedent and the other as the Consequent or result of the antecedent | 2 |

## ABOUT THE AUTHORS

*Dr. Cave is an Assistant Professor of Cognitive Psychology and the Director of Teacher Education at The Catholic University of America. She is interested in how children's writing development can be fostered in a technology-rich authentic learning environment.*

*Dr. Yekovich is an Ordinary Professor of Cognitive Psychology at The Catholic University of America. He is interested in studying how technology can be infused in an authentic learning environment to increase young urban learners' learning.*