EFFECTS OF A NARRATIVE INSTRUCTIONAL STRATEGY ON KNOWLEDGE ACQUISITION AND RETENTION FROM A NUTRITION EDUCATION VIDEO

By

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

2004
This document is dedicated to my Lord and Savior Jesus Christ for calling me to complete this degree and use it in His service.
ACKNOWLEDGMENTS

I wish to express my appreciation to the members of my committee for their time and input during the last few years. I would like to thank Dr. Jeff Hurt for giving me the academic freedom to explore 3D animation and production, which allowed me to gain the knowledge needed to produce the material for this study. I would like to thank Dr. Colleen Swain for her commitment and dedication to my academic growth, and Dr. Patricia Ashton for her gentle wisdom and guidance that greatly strengthened this study. In particular, I wish to thank Dr. Lee Mullally for being someone that puts into practice all that he has taught me. His teachings and actions will forever shape my professional endeavors and aspirations, and serve as a model that I will always emulate. I also wish to recognize the faculty and students of P.K. Younge Developmental Research School. Lastly, I would like to thank Susan, Graham, and Garret, for putting up with me over the last few years and sacrificing their time with me. They are a blessing from God.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>ACKNOWLEDGMENTS</th>
<th>.................................................................</th>
<th>iv</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF TABLES</td>
<td>.................................................................................................</td>
<td>vii</td>
</tr>
<tr>
<td>ABSTRACT.</td>
<td>.....................................................................................................................</td>
<td>viii</td>
</tr>
<tr>
<td>CHAPTERS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 INTRODUCTION</td>
<td>..........................................................................................................................</td>
<td>1</td>
</tr>
<tr>
<td>Narrative</td>
<td>..........................................................................................................................</td>
<td>3</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>..........................................................................................................................</td>
<td>4</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>..........................................................................................................................</td>
<td>5</td>
</tr>
<tr>
<td>Research Questions</td>
<td>..........................................................................................................................</td>
<td>6</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>..........................................................................................................................</td>
<td>6</td>
</tr>
<tr>
<td>Limitations</td>
<td>..........................................................................................................................</td>
<td>7</td>
</tr>
<tr>
<td>Significance</td>
<td>..........................................................................................................................</td>
<td>8</td>
</tr>
<tr>
<td>Summary</td>
<td>..........................................................................................................................</td>
<td>10</td>
</tr>
<tr>
<td>2 REVIEW OF THE LITERATURE</td>
<td>..........................................................................................................................</td>
<td>12</td>
</tr>
<tr>
<td>Narrative</td>
<td>..........................................................................................................................</td>
<td>12</td>
</tr>
<tr>
<td>Perception</td>
<td>..........................................................................................................................</td>
<td>15</td>
</tr>
<tr>
<td>Pre-Attentive Perception</td>
<td>..........................................................................................................................</td>
<td>16</td>
</tr>
<tr>
<td>Narrative Partitioning</td>
<td>..........................................................................................................................</td>
<td>18</td>
</tr>
<tr>
<td>Attentive Perception</td>
<td>..........................................................................................................................</td>
<td>21</td>
</tr>
<tr>
<td>Focus</td>
<td>..........................................................................................................................</td>
<td>24</td>
</tr>
<tr>
<td>Cognitive Structures</td>
<td>..........................................................................................................................</td>
<td>28</td>
</tr>
<tr>
<td>Script Theory</td>
<td>..........................................................................................................................</td>
<td>28</td>
</tr>
<tr>
<td>Schemas</td>
<td>..........................................................................................................................</td>
<td>30</td>
</tr>
<tr>
<td>Narrative Organization</td>
<td>..........................................................................................................................</td>
<td>31</td>
</tr>
<tr>
<td>Story Grammar</td>
<td>..........................................................................................................................</td>
<td>34</td>
</tr>
<tr>
<td>Text Types</td>
<td>..........................................................................................................................</td>
<td>35</td>
</tr>
<tr>
<td>Florida Writes</td>
<td>..........................................................................................................................</td>
<td>38</td>
</tr>
<tr>
<td>Narrative Interpretation</td>
<td>..........................................................................................................................</td>
<td>39</td>
</tr>
<tr>
<td>Social Interpretation</td>
<td>..........................................................................................................................</td>
<td>43</td>
</tr>
<tr>
<td>Summary</td>
<td>..........................................................................................................................</td>
<td>43</td>
</tr>
</tbody>
</table>
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Descriptive Data of Pretest, Postest, and Retention Test for Treatment Group</td>
<td>56</td>
</tr>
<tr>
<td>2</td>
<td>Descriptive Data of Pretest, Postest, and Retention Test for Narrative Organizational Ability</td>
<td>57</td>
</tr>
<tr>
<td>3</td>
<td>Source Table of Analysis of Covariance for Knowledge Acquisition and Treatment</td>
<td>58</td>
</tr>
<tr>
<td>4</td>
<td>Source Table of Analysis of Covariance for Knowledge Acquisition, Treatment by Narrative Organizational Ability</td>
<td>59</td>
</tr>
<tr>
<td>5</td>
<td>Source Table of Analysis of Covariance for Knowledge Retention and Treatment</td>
<td>59</td>
</tr>
<tr>
<td>6</td>
<td>Source Table of Analysis of Covariance for Knowledge Retention, Treatment by Narrative Organizational Ability</td>
<td>60</td>
</tr>
<tr>
<td>7</td>
<td>Descriptive Data for Florida Writes Narrative Scores</td>
<td>61</td>
</tr>
<tr>
<td>8</td>
<td>Source Table of Analysis of Covariance for Knowledge Acquisition, Treatment by Narrative Organizational Ability, Using an Interval Scale</td>
<td>61</td>
</tr>
<tr>
<td>9</td>
<td>Source Table of Analysis of Covariance for Knowledge Retention, Treatment by Narrative Organizational Ability, Using an Interval Scale</td>
<td>62</td>
</tr>
</tbody>
</table>
Abstract of Dissertation Presented to the Graduate School of the University of Florida in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

EFFECTS OF A NARRATIVE INSTRUCTIONAL STRATEGY ON KNOWLEDGE ACQUISITION AND RETENTION FROM A NUTRITION EDUCATION VIDEO

By

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August 2004

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In the present study, the researcher investigated whether a narrative instructional strategy had any effects on learning and retention when nutrition information and concepts were embedded into a narrative educational video. The researcher looked at the differences when information was presented through either an expository or a narrative instructional strategy to determine whether the characteristics of each type of strategy had an effect on learning. The narrative strategy included hermeneutical characteristics that differentiated it from the expository strategy, and the activities within the video followed a narrative plot structure. The expository strategy portrayed a classroom activity centered on nutrition, with no narrative plot structure or hermeneutical characteristics other than those of the classroom activity.

Participants were 89 fourth grade students. The instruction was delivered through 2 nutrition education videos specifically prepared for this study, with one video delivering the narrative instructional strategy and the other delivering an expository...
instructional strategy. Based on their scores from the narrative portion of the Florida Writes exam, students were categorized as either having the ability to organize information into a narrative format or not having this ability. This ability is evidence of a narrative schema and was used as an independent variable to determine whether it had a moderating effect when learning from a narrative instructional strategy.

Dependent variables were a posttest and a retention test, with a pretest acting as a covariate. Analyses of covariance were used to analyze the data. Findings suggest that there were no differences between instructional strategies and there was no significant interaction between the ability to organize information into a narrative format and the type of instructional strategy used. Results of this study may provide guidance for designers of educational products that embed content information into a narrative instructional strategy.
In most instructional design models, the design of instructional strategies places emphasis on how to best organize and structure information so learning can be maximized. This process usually involves following Gagne's (1966) prescription of sequencing content so that instruction progresses from simple learning outcomes to outcomes that are more complex. A task analysis allows the designer to break terminal objectives into enabling objectives, which then guides the sequencing of the instruction, addressing basic tasks first before moving on to ones that are more complicated. Once this is accomplished, the designer then designs the strategies so that learner characteristics are addressed. Strategies may be instructor directed, independent, or collaborative.

This approach to the design of instructional strategies is deeply rooted in the behaviorist and information processing traditions of the last century. However, for some theorists, planned instructional strategies are a questionable practice (Cobb & Bowers, 1997). The implied assumption that every student will learn in a given manner and at given points during an instructional sequence is at odds with their position, where the constraints posed by the design of instructional strategies limit a true focus on individual learners’ cognition. They asserted that the aim should be to create a learning environment where students develop patterns of participation that lead to the development of their identities, a responsibility for learning and an active initiative in the setting of goals and establishment of their own criteria for success (Greeno, 1997). For these theorists,
information processing and behaviorism do not account for the role of culture in the learning process and are incomplete, because they do not address emotional and affective factors, motivation, or memory and perception as they occur in ordinary life (Mayer, 1996; Neisser, 1976).

As research has expanded, theorists (Bruner, 1986; Cobb, 1999; Jonassen, 1991) have posited that learning is a constructive process and the act of constructing knowledge as learners make sense of their world. This new paradigm presents a dilemma for instructional designers wishing to accommodate this perspective when designing instructional strategies and still accommodate the learning theories associated with behaviorism and information processing. Second-wave theorists attribute failed instruction to the over reliance on behavioral objectives and hierarchical sequencing when designing instructional strategies. Instead, these theorists believe that learners need to be placed in settings where they will experience the roles required of them in the real world. It is possible that learners will not learn some of the things an instructor wishes them to learn, but more importantly, they will learn how to be what the instructor wants them to be (Wilson, 1997).

Interpretation is a primary focus of this new wave of cognitive theorists, where the chief concern is not how reality is mapped onto the mind, but rather the meanings generated by the learner (Bruner, 1990). These meanings are situated in activity, settings, social negotiation, and events. “Contemporary cognitive theorists are asking whether the mind is merely a tool for reproducing the real world, or whether it produces its own unique conception of events or objects that is based on individual conceptions or reality. This new group of cognitive theorists is driving the revolution” (Jonassen, 1991, p. 8).
The design of instructional strategies is typically an a priori process where designers borrow ideas from multiple theories and mix them together to create unique approaches to instructional problems. “Professional competence consists in the application of theories and techniques derived from systematic, preferably scientific research to the solution of the instrumental problems of practice” (Schon, 1987, p. 33). In this manner, cognitive psychologists and instructional designers have had a long-standing relationship where the theories generated by one discipline have affected practice in the other. Within the last decade, this relationship has been weakened by a new paradigm. For many theorists, the new perspectives and the practices of instructional designers have irreconcilable differences (Hannafin et al., 1997). Hence, the challenge is to instill constructivist and situated learning practices into the design of instructional strategies and not discard practices that have traditionally been associated with a transmission model of instruction (Cobb, 1999). To succeed in this challenge an approach is needed that accommodates each of the perspectives, yet still can provide some guidance in the design of instructional strategies.

**Narrative**

Narrative, which is commonly considered the telling of a story but is technically considered the representation of a story (Abbott, 2002), may provide an approach to designing instructional strategies that accommodates multiple perspectives. Many theorists and philosophers (Bruner, 1986; Polkinghorne, 1988; Sarbin, 1986) posit that narrative is integral to the way we understand and assign meaning to the world. Still, other theorists associated with the information processing paradigm (Mandler, 1984; Nelson, 1986; Schank, 1990) have recognized narrative's role as a cognitive structure and...
have suggested that it offers a more efficient means of organizing information. Yet, little is known about the effectiveness of narrative as an instructional strategy.

In recent years, the study of narrative has experienced a rapid growth in attention. This interest issues across psychology, the social sciences, research methodologies, education, and other related disciplines. The popularity of narrative has given rise to areas such as narratology and narrative psychology, and there are many that believe the study of narrative should evolve into its own discipline. However, with all this attention, many questions still exist about the nature of narrative and its role in epistemological pursuits.

**Statement of the Problem**

In most cases, professional instructional designers typically choose instructional strategies that address the stated objectives of the instruction, with the palette of known instructional strategies available to the designer consisting of strategies that are closely aligned with either one learning paradigm or another. Thus, for an instructional designer to accommodate the perspectives of multiple paradigms, various instructional strategies must be applied to a single objective. This can reduce the efficiency of time and resources. Further, this can reduce the cohesiveness and flow of instruction when learners must transition from one learning activity to another where content is the only unifying characteristic. What is needed is an instructional strategy that accommodates the various perspectives on learning and allows designers to plan for it prior to instruction.

Narrative has been associated with multiple learning perspectives, and if transformed into an instructional strategy, it has the potential to address stated instructional objectives while accommodating multiple learning paradigms. However, the effectiveness of a narrative instructional strategy to foster learning is not known, and the
research of narrative as a construct is incomplete, focusing primarily on narrative's role as a cognitive schema when recalling itemized lists (Mandler, 1984; Thorndike, 1977). The studies that have addressed narrative and its use in the instruction of content information and understanding have yielded un-interpretable findings. These studies are difficult to decipher because they have multiple independent variables of interest such as delivery, media attributes, or text type; or they have utilized materials that do not effectively isolate narrative as a construct (Lorch, Bellack, & Augsbach, 1987; Maria & Junge, 1993). Narrative may be an effective instructional strategy that accommodates multiple perspectives. However, research is needed to isolate it as a construct and then measure its effectiveness to foster learning of content.

**Purpose of the Study**

The purpose of this study was to compare the effects of a narrative instructional strategy on learning and retention, when nutrition information and concepts were embedded into a narrative educational video. Specifically, the researcher looked at the differences when information was presented through either an expository or a narrative instructional strategy to determine whether the characteristics of each type of strategy had an effect on learning. The narrative strategy included hermeneutical characteristics that differentiated it from the expository strategy and the activities within the video followed a narrative plot structure. The expository strategy portrayed a classroom activity centered on nutrition, with no narrative plot structure or hermeneutical characteristics other than those of the classroom activity.

An investigation was also conducted on the interaction effects of a narrative instructional strategy and the ability of learners to organize information into a narrative format. Specifically, the researcher looked for an interaction between type of
instructional strategy and the ability to organize information narratively, as demonstrated by scores on the Florida Writes examination, to determine if this affected learning and retention. Information gained from looking at this interaction may provide guidance to practitioners wishing to design a narrative instructional strategy for learners that have not demonstrated this ability.

Research Questions

Four research questions were considered for this study:

1. Does a narrative instructional strategy better enhance a student's learning of content information than an expository strategy?

2. Does a narrative instructional strategy better enhance a student's long-term retention of content information than an expository strategy?

3. Does the ability to organize information narratively influence a student's learning of content information when a narrative instructional strategy is used?

4. Does the ability to organize information narratively influence a student's long-term retention of content information when a narrative instructional strategy is used?

Definition of Terms

In many academic writings regarding the subject of narrative, there is often confusion between the terms *narrative* and *story*. This confusion is due in part to many theorists outside of the field of literary theory using the terms interchangeably. Literary theorists insist that the two terms have entirely distinct definitions. The literary theorist's definition of story is the actual manifestation of the setting, characters, plot, and events that exist either in real life or as a fictional account that is established in the mind of an author. It follows then that the term narrative is the representation of a story created by the discourse that is used to communicate that story. This discourse need not be verbal or textual, but can take many forms, including film, painting, sculpture, and other artistic
expressions. Given this definition of narrative, it is understood that story is something that precedes narrative. A story, when played out, occurs in real time. However, a narrative may compress all the events of an entire day into one paragraph that takes less than a minute to read, or it may reverse the order of the events to create tension as is often done in a flash-back episode.

For the purposes of this study, the terms narrative and story were used interchangeably to avoid any confusion. Since most of the theorists cited in the review of the literature do not make the distinction between story and the discourse that gives life to narrative, it was not necessary to make that distinction here. The following definition served this study’s purposes for narrative and story:

**Narrative/Story** is an event or sequence of events organized around a setting, characters, and a plot that is generated by causal connections, and these causal connections are typically produced by a source of conflict within a narrative.

The term *expository* is most often used as the antonym to narrative, where narrative is given a much broader definition that refers to any recounting of temporal events. In this view, expository describes any communication that presents information in a clear and precise manner. Because the current study narrowed the definition of narrative, it follows that the term expository, when used as the antonym to narrative, included the communication of information that does not fit this study's definition of narrative. This included the communication of temporal events that resemble daily routines, yet lack a plot structure with causal connections.

**Limitations**

This study was limited in its ability to make generalizations to other grade levels. The sample selected possessed characteristics that do not generalize to students of grade
levels higher or lower than the fourth grade. The reading ability of fourth graders was taken into consideration when deciding on a sample population. Fourth graders typically have reached a level of literacy that is appropriate for the present study's instrument. Students in lower grade levels would not be able to complete the instrument, and students at upper grade levels have had more exposure to language arts instruction and written narratives, confounding an investigation into the relationship between an ability to organize information into a narrative format and learning from a narrative instructional strategy. Further research will be required to establish valid generalizations across differing grade levels.

Significance

Not much is known about how the characteristics of an authentic learning environment contribute to learning. When planning for situated learning, it would benefit designers to know which elements of a context contribute to learning and which inhibit learning. This study has the potential to increase understanding of one of those elements: narrative. By isolating narrative as a construct, the researcher investigated the effects when educational concepts are embedded within a narrative instructional strategy. It is hoped that the findings from this investigation will inform instructional designers of the possible implications of using a narrative instructional strategy in the design of face-to-face instruction, the production of educational videos, the creation of web-delivered instruction, or the development of educational software.

The epistemology that has guided educational practice and the design of instructional strategies for many decades has focused on the perspective that representation precedes all else (Brown, Collins, & Duguid, 1989). In contrast, the situated and constructivist learning perspectives posit that perception and activity exist
epistemologically before representation. These differing positions make it difficult for practitioners and designers to determine what in instruction should be made explicit (transmitted to the learner in an expository manner) and what should be implicit (generated by the learner from the affordances of the situation or activity). The approach of traditional instructional designers when designing instructional strategies is to make as much information explicit as possible. This explicit approach often lifts concepts out of their natural context, hindering knowledge transfer and an implicit understanding generated by the affordances of that context. An example of this would be children who learn how to solve addition and subtraction problems in the classroom through explicit algorithms, but have difficulty on a street corner calculating change from a vendor (Lave, 1988). Yet, current research has not identified the specific characteristics of a context that aid in the generation of understanding. Perhaps narrative is one of these characteristics and plays a role in the learning situation.

At the center of constructivist thought is the notion that learning is first an interpretive process, where interpretation precedes understanding. Understanding then becomes "the outcome of organizing and contextualizing essentially contestable, incompletely verifiable propositions in a disciplined way. One of our principal means for doing so is through narrative: by telling a story of what something is ‘about’" (Bruner, 1996, p. 90). At the center of situated learning is the situation itself. In this perspective, the situation cannot be considered separable or ancillary to the learning event. It is not a neutral bystander to cognition, but rather it is said to co-produce knowledge (Brown, Collins, & Duguid, 1989). The characteristics of the situation are integral to what is
learned, characteristics such as activity, setting, social interaction and negotiation, and causal elements. These characteristics are also the primary characteristics of narrative.

The components of narrative such as setting, social interaction and negotiation, activity, and causal events are elements that can be planned for by instructional designers in the design of a narrative instructional strategy. Instructional content can be embedded within a narrative, and the narrative can be structured so that important concepts are critical to the unfolding of the story. Similar to the way in which a playwright composes a drama, a designer could plan the instruction so that the learning event unfolds as an intriguing narrative. Activities can be structured so they are rich, complex, and authentic. Similarly, settings can be planned for so that recurring features of the environment provide affordances and promote the indexical representations that learners form during activity. Social interaction and negotiation are events that instructional designers have addressed through cooperative instructional strategies for years. The causal elements, being grounded in the culture of specific domains, can be planned for by creative designers who sequence the events of instruction so that cause-and-effect connections exist during learning activities.

Summary

Thorndike (1977) first identified narrative cognitive structures as they are used in the comprehension of narrative discourse. Subsequent studies have explored narrative through the perspective of schema theory. However, the role that narrative plays as an interpretive mechanism has received less scrutiny. In particular, the interaction of a narrative schema and a narrative interpretation of the world raises many questions about the process of knowledge acquisition. The answers to these questions may offer improved techniques for instructional designers seeking better strategies for sequencing content and
designing instructional strategies. In the current study the researcher sought to examine narrative's potential as an effective instructional strategy by isolating it as a construct and measuring its effect on learning. An examination was also conducted on the effects of the interaction of a narrative instructional strategy with a learner's ability to organize information into a narrative format. It was hoped that this examination would provide insight for the use of a narrative instructional strategy with learners who have not demonstrated the ability to narratively organize information.

In chapter 2, the relationship that narrative has with the learning theories of multiple perspectives will be explored. Because narrative encompasses the philosophical views of the current paradigms driving education, the theories and ideas associated with behaviorism, information processing, and constructivism were addressed to present a clear picture of how narrative accommodates the principles of each.
CHAPTER 2
REVIEW OF THE LITERATURE

How humans perceive, attend to, process, and interpret the world through narrative contributes to learning and has the potential to inform pedagogical practice and the design of instructional strategies. After first defining narrative, an exploration of human perception of events, persons, and objects, looking at the relationship between perceptual theory and the characteristics of narrative will be provided. How narrative influences the attentive behavior of humans, including high-focus and low-focus thought processes, will be discussed. This chapter will then address how narrative influences cognitive structures during processing and give attention to the relationship that those structures have with language arts instruction and the ability to organize information narratively. Finally, attention will be given to how narrative influences our interpretation of the world before the assignment of meaning to events, objects, and persons.

Narrative

Robert Coles (1989) called narrative “everyone’s rock-bottom capacity, but also the universal gift” (p. 30). It is said that narrative is embedded in all human thought and action. Humans “dream in narrative, daydream in narrative, remember, anticipate, hope, despair, believe, doubt, plan, revise, criticize, construct, gossip, learn, hate, and live by narrative” (Hardy, 1977, p. 13). From a very early age, persons recognize narratives and are aware of their structure, although they sometimes lack the capacity to describe them. They know intuitively what is and what is not narrative. They know that a list of categorized objects is not a narrative. They know that a mere sequence of actions is not a
narrative. They know what narrative is, but give it no regard in terms of how it drives behavior, governs social interactions, or affects their ability to learn.

Polkinghorne (1988) posits that individual identity consists of a *self-narrative*, a self-constructed and maintained life story of an individual that integrates a person's past experiences into a coherent story while simultaneously projecting a unique future story. This self-narrative draws together the theme of a person's life, where the future is the part of the life story that remains unfinished.

The characteristics of a narrative that distinguish it from other forms of expression, such as exposition or explanation, have been the topic of some debate. What elements must exist in a narrative that would cause a person to recognize it as a narrative? Literary critics and structuralists have deliberated over this issue for years and have yet to achieve complete consensus. Yet, while the differences in opinion about the topic are many, some key characteristics of narrative are commonly accepted as core elements.

Before a narrative can exist, there must be what Branigan (1992) calls a *disparity of knowledge*. This means that the narrator, whether it is a novelist, a film director, a playwright, or a grandmother, must know something that the listener or audience does not know. For a narrative to be born, knowledge must be unevenly distributed. If the listeners or readers of a narrative knew everything a storyteller or narrator had to say, then the possibility of a narrative would not exist, because they would already possess all the information. Similarly, there must be a *disparity of knowledge* among the characters or subjects in a narrative. The characters within the narrative must each have differing amounts of knowledge regarding the events that occur. Without this, there would be no reason for the characters to interact.
Bruner (1996) states that a narrative is made up of a sequence of events, delivered through discourse, and communicates something that is unexpected or that someone may have reason to doubt. The object of the narrative then is to address the unexpected in such a way as to come to a resolution. Because of this, a narrative has two major components: “a sequence of events and an implied evaluation of the events recounted” (Bruner, 1996, p. 121). Further, a narrative is made up of “grammar-like” rules that determine how characters and events are ordered so they fit a particular plot structure. These plot structures are highly abstract and can fit an endless variety of stories. According to Northrop Frye (1964), there are just four types of plot structures: comedy, tragedy, romance, and irony. These represent the main genres.

Research with children has suggested that at a very early age they possess an understanding of narrative structure. Jean Mandler (1984) in working with second, fourth, and sixth graders, found that children possessed an abstract knowledge of an ideal narrative structure. After being given several versions of a story with the elements mixed, children tended to regroup the separate episodes into an ideal form. A second experiment with adults was also conducted by Mandler, with similar results. However, the adults tended to rely less on narrative structure in the organization of recall. Mandler states “stories have an underlying or base structure that remains relatively invariant in spite of gross differences in the content from story to story” (p. 22). The basic narrative structure that holds for all variations of stories is that it begins with a setting where the narrator introduces the locale, the time, and the characters. Once this has been done, one or more episodes will follow that contain a beginning and a development. These episodes are characterized by a character or group of characters reacting to events and then setting a
goal, followed by the character pursuing a path toward goal attainment. The episodes conclude with an outcome of the character’s attempt to reach the goal (Mandler, 1984). Other research has found that in order for a segment to be considered a narrative, it should have at least an animate protagonist and a causal sequence of events (Stein & Policastro, 1984).

In order for individuals to make sense of a narrative, they must first have an intuitive notion of plot (Egan, 1989). For narratives to be meaningful, they must be preceded by a notion of a plot-rhythm that alternates expectation and satisfaction. Narratives must also be based on binary opposites such as good and evil, life and death, security and danger, and courage and cowardice. These binary opposites are the source of the conflict within a narrative.

Perhaps in its most rudimentary form a narrative is best described as having characters, a beginning, a middle, and an end. The beginning establishes setting, character, and conflict. The middle elevates the level of conflict and contains one or more episodes where the characters attempt to overcome obstacles. The end brings about a resolution of the conflict. These elements are all organized around a chain of events called a plot. The plot is driven by the conflict in the narrative, and the conflict is created by the tension between binary opposites. It is this rudimentary form that will serve as the construct for the present study.

**Perception**

As humans encounter the world, they actively locate objects, persons, and events in space and time. It is through the narrative form that they do this, as the narrative form is the most natural way to give shape to space and time in the human mind (Abbott, 2002). In the process, this narrative orientation to the world allows persons to generate a
context into which the world can be assimilated, thus producing a frame for everything they come across during their day, including notable events as well as inert, everyday scenes. Objective reality may exist, but humans can only be aware of it through their senses. Given this and a narrative orientation to the world, an examination of how the processes involved in sensing the world such as perception, attention, and interpretation are affected by a narrative capacity is in order.

Pre-Attentive Perception

When readers look at the border of this page, they perceive the edge of the paper. No matter how hard they might try, it would be an impossible task to see it as anything but an edge. This is because a huge amount of perceptual organization occurs pre-attentively (Marr, 1982; Pomerantz, 1981; Treisman, 1986). This organization has a great effect on how humans approach the world.

Persons respond to their environment based upon their perceptions. The minute they walk out the door in the morning they are greeted with a vast amount of environmental information that causes them to respond. They may pull their coat tighter to ward off a cold wind. They may put on sunglasses to counter a sunny day. They may slow down in heavy traffic to avoid a dangerous situation. Most responses people have to environmental changes are learned. In this way, perception is the product of both physiological and psychological processes through which humans make sense of the environment.

For most organisms, environmental information is processed by the central nervous system. It is the physical firing and inhibition of neurons that convey the environmental information to the brain. For every time that a neuron fires it must be re-stimulated before it can fire a second time. Because of this the brain only receives
information about the environment when there has been a change in that environment or a change in perspective, and the change must reach a high enough level so that the neurons are sufficiently stimulated (Johansson, von Hofsten, & Jansson, 1980).

Nevertheless, the understanding of human perception is more complicated than the understanding of perception in the plant and animal kingdom. Plants respond to environmental factors such as light and water without the influence of variables such as expectations or inhibitions. Insects are attracted to their mates based upon chemical secretions and are not influenced by emotions or societal norms. Humans are emotional creatures whose thoughts are not easily observed. Further, their responses to environmental factors are influenced by psychological constructs. Some physiological responses can be directly observed, such as a pupil dilating, or goose bumps appearing on a cold day. However, most responses are more greatly influenced by psychological processes, responses like the tapping of feet to music, or smiling when greeting a good friend.

Historically there have been two dominating opinions about when sensory stimuli become environmental information. One view is that information exists in the environment in the form of light rays, sound waves, tactile impressions, or odors and is \textit{pickup-able} by humans (Gibson, 1979). The other view is that sensory stimuli cannot be made coherent until the conscious mind has attended to it. Thus, our prior knowledge and expectations determine what we perceive (Neisser, 1976). However, recent studies suggest a view that accommodates both perspectives. Current opinion recognizes the importance of prior knowledge and attentive processes in perception, yet accepts the position that the majority of perceptual organization occurs pre-attentively. In this view,
our conscious attentional processes are provided information that has already been organized. This organization affects the interpretations of perceivers (Levie & Flemming, 1993). If the narrative form aids the pre-attentive organization of information embedded within a narrative by guiding expectations, it is probable that a narrative instructional strategy could induce greater learning when content information is embedded within a narrative.

**Narrative Partitioning**

To understand the process of perception it is paramount to consider the relationship between perception and other cognitive activity. It is particularly important to consider perception’s relationship with narrative thought activity. How does narrative influence pre-attentive organization? Can the abstract, symbolic form of narrative affect perception and possibly predispose humans to certain perceptions and interpretations?

One of the basic, pre-attentive perceptual processes is the differentiation between figure and ground. Figure-ground organization begins early in the perceptual progression and is accomplished by the perceptual creation of figures that stand out against a background. The distinction between figure and ground is formed by boundaries such as continuous edges, an abrupt change in texture, or common characteristics between juxtaposed objects. This distinction can be expanded to an ecological level where subject partitioning separates the environment into what is given and what is taken. Partitioning is the means through which the background is held still for the perceiver so that the object or subject of interest is made perceptible. Partitioning also delineates what in the environment is *pickup-able* by creating a static background against which a subject is contrasted (Levie & Flemming, 1993). This pre-attentive partitioning works on various levels, including the abstract, and it is at this level where narrative partitioning exists.
Murray (1995) describes narrative partitioning as the point at which “the practical becomes the expressive-how and when the predictable world gives way to narratable action; this is the particular variety of differentiation we term ‘narrative partitioning’” (p. 15). In conjunction with the discrimination of a figure against a static ground, expressive meaning must standout against the backdrop of practical space. Thus, simultaneous to the physiological processes that allow persons to perceive an objective reality, another process, a psychological process, operates in a symbolic space, allowing persons to frame perceptions for interpretive viewing. Narrative partitioning distinguishes between the tedious phenomena that take place around people everyday and the narratable phenomena.

It is important here to explain the concepts of tedious phenomena and narratable phenomena. One way to do this is to use the example of a birthday party video. Due to the ubiquity of video cameras in today’s society, it is doubtless by now that most have seen a home movie, and the birthday party is one of the most common home movies. Birthday parties, especially those of children, typically follow a standard plot line with slight variations: everyone arrives, children play for a while, everyone gathers to watch the opening of presents, a cake is brought out, candles are lit, the traditional birthday song is sung, candles are blown out, cake and ice cream are served, children play some more, everyone departs. These plot highlights are narratable phenomena. People expect them and they are representative of what can be loosely called a birthday genre. This is not to say that they are the only narratable phenomena. A notable birthday gift, an argument among the children, meeting someone new, and ice cream on the carpet are all narratable phenomena in that they are distinguishable against a static, non-eventful background.
Now, when watching the video of a birthday party, a video where the camera operator continued to roll the tape throughout the entire event, there are certain phenomena that immediately become tedious. People may not notice these phenomena when attending the party in person, because they are guided by their own perceptions in addition to their perceptions determined by attentive behaviors. Yet, when watching the video, they are at the mercy of the perceptual processes of the video camera operator, who more usually is a family member of the birthday child, and a person with perceptions different from the viewer. While watching the video, one might see clips of people standing in the background talking, phenomena that may not be perceived as narratable to participants at the event. In some cases there may be many phenomena occurring in the video: Someone throwing away gift-wrapping paper, a person cutting slices of cake, another person wiping crumbs off the table, someone in the background not singing as the rest of the crowd sings the birthday song. At the actual event, these were tedious phenomena, and their tedious nature will become evident if the video is too long. People do not perceive them in the environment because they are irrelevant to their own self-narrative. However, to the camera operator they may have been very relevant, and thus narratable phenomena. These differences in the perception of individuals are one reason for the rise in event videography. Realizing that people want to record certain events like weddings and parties in such a way that will be entertaining for all viewers, videographers now offer their services to families and, in effect, change the event itself by insisting that the event sustains a narration for the camera. Thus, the only events recorded are narratable phenomena that are common to all humans.
Every waking minute of every day humans perceive the world around them. Although physiological processes allow them to perceive an objective reality, perceptive activity is also a product of psychological processes. Environmental information is pre-attentively organized by cognitive functions that predispose us to perceive select information. A narrative orientation, as well as narrative partitioning act upon this pre-attentive organization and ultimately influence interpretation. However, attentive behavior also has a hand in this activity, where narrative is a guiding factor as well.

**Attentive Perception**

At any given moment, persons are only aware of a portion of their environment. Were they to be aware of the entire environment around them, the sensory bombardment would be overwhelming. Environmental information like normal bodily activity, temperature, ambient sound, smells, or light variations is not always perceived due to a limited consciousness. In essence, humans have a limited ability to manage external and internal environmental information, and attention is the process that selects which and how much information is elevated to consciousness. It is through attention that people search the environment and choose the stimuli they wish to consider while simultaneously ignoring the rest of the environment. This gives rise to what is called the “cocktail party phenomenon” which is a direct result of a limited consciousness as well as attention’s direction of it.

Attention is vital to the perception of the environment. Humans are active, naturally curious, participants in the world, behaving in such a way in order to learn about the environment. However, they also have needs and goals that direct attention at any given moment or situation. Persons have varied goals relevant to perception for varied situations (Gibson & Rader, 1979). For instance, a mountain climber directs more
of his attention to where he places each foot during each step than does a person taking a leisurely walk down the road. An artist painting a mountain scene with oil and canvas pays more attention to the multitudes of hues in the setting than a mountain biker negotiating a trail down that same mountain. A child building a house out of playing cards is more attentive to the air movements within a room than a child watching a television program. Thus, perception is directed by attentional processes, which in turn are guided by individual goals and needs. It is believed that these goals and needs are governed by our ongoing self-narratives (Polkinghorne, 1988).

Many theorists consider perception to be an additive process, where a person contributes something, whether this is meaning, actions, or words, to the sensory stimulus. Some believe that persons construct knowledge of their environment by forming schemas (Anderson, 1984; Mandler, 1984; Rumelhart, 1977), while others adhere to the idea that humans must correct static sensory information by accommodating it within prior knowledge and enriching and enhancing stimuli by relating it to existing long-term memories (Marr, 1982; Pomerantz, 1981).

Gibson (1977) presents a somewhat different view, one that considers stimulation to be a lucrative source of information that exists through space and time. The unique position of Gibson’s theory is that information is contained within the stimuli and that human’s must learn to perceive it.

There is a structure in the array, relational information that does not have to be pieced together because, like truth, it is already there. This is the assumption I want to proceed with. I do not want a construction theory, with processors at every stage like an assembly line. (p. 157)

For Gibson this array is spatiotemporal. Stimulation does not exist in a static form, preserved like a photograph, immobile in space and time, but rather it specifies settings,
objects, and events. Thus, stimulation is a range of information available for differentiation in which a person perceives a particular object within the entire spaciotemporal array. In this view, perception is learned as humans develop and acquire experiences that allow them to become better at perceiving information that had already existed in the environment. This information must be sought out and differentiated through attentive mental activity.

A helpful way to explain Gibson’s theory is to use the example of going to the movies. When persons see a movie at the theatre, they are able to extract certain types of information from the film. They discern the main character, the antagonist, major plot events, and key aspects of the settings, and these natural perceptions allow them to follow the story of the movie. When first viewing the movie, people perceive it at a somewhat low level of differentiation. However, if they were to go back to the theatre and see the movie again, or buy or rent the movie at the video store and then watch it at home several times, they would be able to perceive an increased level of information from the film. They would be able to extract more clearly the subplots, the dialogue, and the objects that exist in the background of settings, clothing, or even the musical score. This information existed during the first viewing of the movie, yet they did not extract it. Gibson states that humans do not improve perception by enriching the stimulus with schemas or by constructing it using prior knowledge as a framework, but rather by viewing the film and then directing and re-directing attention. It is the relational information that humans attend to, the distinguishing characteristics and patterns regarding relationships among the components, rather than the individual pieces of information.
Narrative’s relation to Gibson’s theory is not simply limited to the spatiotemporal qualities of a stimulus; it is possible that narrative plays a huge role in guiding the attentive process. The narratives of young children are less complicated, because meeting their basic needs serves as the driving goal of their self-narratives, which in turn guides their attention toward those things in the environment that are related to those simple goals. Thus, they perceive less of the environment than older children or adults. The narratives of adults vary in their complexity, and the attentive processes are guided according to their embedded goals. As children grow older, they re-experience narratives with similar goals and common qualities, and as a result they become aware of narrative genres. They learn how to direct their attention in these genres and subsequently learn how to differentiate the relevant information from the environment.

Focus

Searle (1992) states that “attention goes away from where it is not needed” (p. 139), yet he believes it does not go away completely, it is only focused elsewhere. Hence, attention and focus have a closely aligned relationship. You might even say that attention is a function of focus.

The thoughts of every person exist along a spectrum, a continuum of varying ways in which we think. The way that any person thinks, at any given point in time, depends directly upon mental focus, and human focus can either be high, medium, or low and moves up and down this continuum according to our subliminal responses to physiological states (Gelernter, 1994). In other words, focus is similar to a degree of alertness, yet cognition is also affected by this change in focus. When we reach high focus, our thoughts become more analytical and inductive, and our perceptions are converted into readily retrieved memories. When we travel down the continuum into the
realm of low focus, our thoughts become diffuse and are held together more by emotion and feeling than by analytical reasoning.

To illustrate this, a look at two types of drivers, a novice driver and an experienced driver, is useful. For a beginning driver, just entering the world of vehicle transportation, many things are new; traffic laws, traffic norms, vehicle instrument panels, clutches, shifting patterns, and how to look out for other drivers. A new driver may have observed someone else driving, but because they have not had to interact in this transportation world, they have not yet developed a level of confidence and expertise behind the wheel of a car. As such, driving is a very high focus activity. They experience a high degree of alertness when driving; they scrutinize the behavior of other vehicles on the road; they have an elevated consciousness of road signs; they actually monitor the tachometer to determine rpm’s before shifting gears; and they even keep the defensive driving strategies taught by driving instructors on the forefront of their thoughts. Thoughts during this high focus activity are narrow and penetrating. While driving, they assemble a host of memories from the Driver’s Education classroom, the Driver’s Handbook of Traffic Laws, and the many directives given by the teacher, and once assembled these memories are analyzed and drawn upon to help solve the obstacles encountered on the road. Such are the thoughts of the novice driver.

After several years, people become experienced drivers. They develop proficiency and confidence behind the wheel of a car and no longer need to assemble all those memories. One might even say that they have practiced driving so much that most of the operations behind the wheel become second nature. Thus, as experienced drivers, they often diffuse their focus to other things, and give the act of controlling the vehicle a lower
level of focus. People do not drive unconsciously, but rather they direct a lower level of attention to it (Dennett, 1991). Thoughts during this low focus activity are broad and dispersed, governed strongly by feelings and emotions. The mind wanders in a pensive manner, and often people may drive several miles down a familiar road and have no recollection of passing any of the familiar landmarks. Their thoughts drift around in this state of consciousness, and thoughts about work, personal relationships, and fond memories are brought to the forefront. Unlike at high focus, where humans concentrate on one aspect of many memories, at low focus “many aspects of one memory” hold their attention (Gelernter, 1994, p. 21). It is believed that creativity is closely associated with this type of thought (Penrose, 1989).

Mental focus controls the relationship a person has to thoughts, and in turn controls the relationship to perceptions. Sometimes people perceive the environment and are drawn to the details, and so thoughts and perceptions become highly focused and penetrating. They inquire about the details and possibly zoom in for further inspection. Other times they perceive the environment in a very low focus, diffuse manner; where thoughts become more expansive and are influenced more by mood and ambiance. Here people are less curious about the environment and often become pensive, perusing memory, rather than inspecting the details. Thus, if mental focus controls the relationship to thoughts and perceptions, then what controls the relationship to a human's state of mental focus?

Humans could not exist permanently at one end of the focus continuum and retain their sanity. There must be an ebb and flow from one level of focus to another. Narratives may govern this ebb and flow by serving in a regulatory function. When in the course of
their own self-narrative people are actively pursuing a goal, their thoughts move up the continuum into the realm of high focus. The level of high focus reached is determined by the amount of cognitive resources needed to achieve the goal. On the other hand, when not actively pursuing a goal, thoughts move down the continuum into low focus. Because there is no immediate conflict associated with a goal, thoughts can become more diffuse without any negative consequences. Thus, the ebb and flow of a narrative is directly related to the ebb and flow of focus. A novice driver is actively pursuing a primary goal when behind the wheel of a car--to arrive at a destination safely and without incident--therefore, a high level of focus is required. The experienced driver is less actively pursuing a goal when behind the wheel. Her primary goals usually exist in other settings, such as work or the home; thus her level of focus can be lower. It is possible that focus can be manipulated by a narrative instructional strategy that controls the ebb and flow of focus through the direct control of a plot rhythm, where alternating the levels of tension and expectation in the story will raise the level of focus at designated points so that content details are perceived more efficiently.

It should be noted that just because a conflict in the environment exists does not mean that goal-pursuing activity automatically begins. If the environmental conflict is incorporated into the self-narrative of the individual, manifesting itself as a goal that requires action, then focus will reach higher levels. Further, the absence of conflict in a serene environment does not automatically lower focus. A person can be relaxing in a hammock in the backyard and still be highly focused on how to get rid of the crabgrass in the lawn. If the mind is in pursuit of a goal, then focus will be high.
The range of focus level a person is most comfortable within varies from person to person. All humans are able to achieve a large range on the continuum, but are more comfortable near a specific level of focus (Gelernter, 1994). A person’s ability to sustain high focus however does not imply a high level of intelligence, even though intelligence quotients measure high focus activities.

**Cognitive Structures**

**Script Theory**

Script theory proposes the concept of themes or plans that are used by individuals when generating meaning and understanding. Roger Schank (1990) calls these plans *scripts*. In this theory, all memory is considered episodic, whereas instead of being organized into semantic categories, it is organized about personal experiences. Scripts act as broad episodes where specific information can be placed into memory and into which missing information can be filled.

Schank (1990) suggests that all experiences are understood through the use of scripts, and that scripts make mental processing easier by allowing us to think less. An example of this is the restaurant script where a person does not have to guess the intentions of an approaching waiter. Here less thought is required, because a script can be applied to a general situation, freeing up mental capacity. In this situation, a script serves to establish a set of expectations about what happens next in a generally understood setting.

On a daily basis, an individual uses many scripts in the act of performing mundane activities such as driving to work, riding in an elevator, or eating breakfast. Indeed, learning for young children mostly involves becoming familiar with the scripts of their culture. Once established, scripts become a store of prior experiences where new
experiences can be coded. In this way, they act much like a memory structure that informs us how to behave and perform without our even having an awareness of them. Thus, thinking becomes a matter of finding the appropriate script instead of having to produce new ideas or generate new questions. By doing this, it is not necessary to analyze every new circumstance and commit cognitive resources to this analysis.

Thinking is a matter of indexing, and stories provide us with a huge number of indices. The greatest amount of learning occurs when a story containing large amounts of indices can be compared to a large amount of previous experiences (Schank, 1990). Stories can be prototypical in nature, providing persons with a framework that can be used to solve future problems. We can also use stories as a common mechanism for communicating.

Sometimes what one already knows is what everyone knows. We don’t live in a cultural vacuum. If most of what we know is stories, then most of those stories are probably not our own. We certainly can use and learn from the stories of our friends and family, but we also hear the stories of our culture and especially of various sub-cultures. We learn these stories by going to school, by watching television, by reading books, and generally by listening to those around us. (Schank, 1990, p. 190)

Although scripts seem to explain some cognitive processes, they are not a complete answer to how learning occurs. Script theory was developed as a result of Schank’s (1990) work with artificial intelligence, where computers were programmed to learn through the use of scripts. Humans are much more complex, and other abstract structures as well as the motivations involved when experiencing the world need to be considered.
Schemas

A schema is an organizational unit that serves as a mental framework upon which information can be attached, facilitating memory and understanding (Mandler, 1984). When experiencing the world, humans use schemas to provide an abstract scaffolding of objects and relationships that guides perception and problem solving. Schemas can exist at varying levels and can be arranged in a hierarchical order. A general schema can be made up of several sub-schemas. For example, a birthday party schema can consist of several sub-schemas such as a how-to-eat-cake schema or an open-the-presents schema. According to schema theory, the recall of events is proportionate to the organization of a particular schema and how typical the event is.

An event schema is made up of units, organized hierarchically, that characterize knowledge of event sequences. It can be used to predict events and the order in which they might occur. Unlike a categorical schema, which organizes objects according to a class inclusion structure, an event schema arranges knowledge in general classes that each contain more specific events. For example, a gorilla, an orangutan, and a baboon are all examples from the class of primates and must meet the categorical requirements for inclusion in that class. However, mashing the accelerator, monitoring the rearview mirror, and shifting gears are not examples of driving a car, but rather they are the parts of driving a car, the temporal actions that when put together, constitute the whole. In this way, an event schema is a collection of “part-whole relations” instead of being a class-inclusion structure (Mandler, 1984).

The connections in an event schematic structure are temporal (Mandler & Johnson, 1977). The major advantages of event schemas over classification structures is that when a particular class is mentioned a particular class member may not be activated,
but because most of the parts of an event schema are almost obligatory, they may be automatically activated. Further, because event schemas possess horizontal connections among parts in a manner that categorical structures do not, and because the hierarchical connections are stronger, this type of schematic organization has produced better recall (Rabinowitz & Mandler, 1983).

A scene schema is closely related to an event schema in that it is a collection of experienced scenes rather than a class-inclusion hierarchy. Information stored in this type of schema usually consists of inventory information, such as the objects that are present in a scene, and spatial information, which is how a particular scene is arranged spatially. This type of relationship has proven very efficient for recall, evidence of this being the use of spatial arrangements as a mnemonic device like the method of loci (Mandler, 1984).

**Narrative Organization**

Of particular interest in the present study is whether a learner's ability to organize information into a narrative form affects learning from a narrative instructional strategy. One consideration for this study is that learners may have more exposure to narratives in literature and language arts instruction and subsequently develop a more clearly defined narrative schema, enhancing their ability to organize information into a narrative format. Another consideration is that learners develop narrative schemas independently of language arts instruction, where differences in narrative organizational ability may be due to maturation, intelligence, or cultural influences. The source of this ability is not the focus of this study. However, it is possible that learners who demonstrate achievement in this area, evidenced by their ability to organize information narratively on a written
examination, will learn more effectively from a narrative instructional strategy than those
learners who have not demonstrated this ability.

Research of narrative text organization and narrative schemas suggests that
younger learners have less structured narrative schemas than do older learners. Studies of
reader’s expectations for story structures provide evidence that there are age-related
differences in how learners structure stories and the types of elements they expect within
stories (Stein & Glenn, 1979; Stein & Nezworski, 1978). Whaley (1981) observed
differences between third-grade, sixth-grade, and eleventh-grade students’ expectations
for story elements, with the younger students having structural expectations less
frequently than the older students. The structural elements identified in these studies are
setting, beginning (when some event occurs), middle (protagonist reaction and formation
of a goal), attempt to achieve a goal, outcome, and ending. These expectations for story
structures are considered to be schemata (Mandler & Johnson, 1977). Other research of
narrative organization suggests that younger learners rely more frequently on temporal
connections, and older learners incorporate more causal connections into narrative
structure, indicating that more complex organization occurs with age (Waters, 1987).
Wimmer (1979) found that children who used more causal connections in their narrative
organization scored better on recall for stories.

Differentiating information contained within a narrative according to level of
importance represents the hierarchical organization of narrative schemas utilized by
viewers or readers. Studies of levels of importance suggest that children and adults differ
in their narrative organizational hierarchy, resulting in differing levels of comprehension
and recall of narratives (Lorch et al., 1987). Further, comprehension levels of narratives
should not be attributed solely to a child’s limited memories, instead it may be that they organize their schemas differently, structuring their hierarchies in a qualitatively different manner (McConaughy, 1980).

For years language arts educators have emphasized the development of a learners’ ability to comprehend narratives when reading. Indicators of a child's ability to comprehend a narrative text include finding the main idea, detecting cause and effect relationships among events, sequencing events correctly, making inferences about the information contained within a text and using it to make assessments about the text, and summarizing the events depicted within a narrative (Stein & Trabasso, 1982).

Inference is a crucial skill that children must have to demonstrate mastery of these indicators. When a reader is unable to make the necessary inferences that link events causally, then a narrative text will not likely be remembered or understood. Readers draw on previous experiences with narratives and on their experiences with social situations when thinking inferentially about a narrative text. To do this, the reader imposes organization upon the text and relies on a knowledge of the text events (Stein & Nezworski, 1978).

To assess the comprehension of narratives, educators and researchers have traditionally used tests of recall and the summarization of incoming information as measures. These measures are highly correlated with the level of importance assigned to events within a narrative, yet they are limiting when comprehension processes are the focus of investigation (Omanson, Warren, & Trabasso, 1979; Stein & Trabasso, 1982). Further, these measures do not assess the acquisition and retention of content information embedded within a narrative, nor do they assess the comprehension of subject-area
concepts. Research is needed to assist in the construction of a model that will provide educators and designers guidance in the use of narratives as an instructional delivery method, one that accounts for a learner’s ability to organize information into a narrative format.

**Story Grammar**

In addition to story structure, there exists a story grammar, which provides a rule system governing the regularities found in a story’s text, much like linguistic grammar. Story grammar identifies the units that comprise the story, their sequence, and constituent structure. From this story grammar and the interaction with stories, persons construct a story schema that becomes a mental representation of those regularities. This story schema can exist at various levels of abstraction and can have various sub-schemas within it. For instance, a story may contain several episodes, each with its own story schema. These episodes contain specific information from the story, and the story schema provides a mental representation for organizing the memory of this information. Because the sub-schemas are arranged in a hierarchical fashion, information organized at higher level schemas (that is story schemas from episodes more important to the central story) will be recalled more efficiently than information organized at lower level schemas. Rumelhart (1977) and Thorndike (1977) conducted research on recall corresponding to story schema levels and found that higher-level story schemas produced better recall.

Story schemas are not limited to novels, folktales, and the cinema, but are used in daily activities. For the average person, a story structure is imposed on many types of information, and Mandler (1984) posits that narrative structures are dependent on human capacities and originate from the abstraction of experience.
Recent studies have focused on ideal "story-grammars" and have suggested that children as young as four are able to recall events from a narrative in the proper order and make the causal connections (Mandler & Johnson, 1977; Stein & Glenn, 1979). It has also been suggested that the rudiments of story structure are incorporated into thought processes before the age of 4 (Polkinghorne, 1988). These studies note that the narratives used in earlier studies did not adhere to logical narrative structures, presenting ill-formed narratives, and thus presented the children with a more difficult assignment. Subsequent studies were conducted on pre-readers and suggest that children are aware at an early age of "story-grammars" and can intuitively recognize their ideal form based upon expected causal ordering and re-write rules. Yet, these studies do not measure the amount of content information learned from narrative or how narrative organizational ability influences learning from a narrative instructional strategy; they only suggest that a narrative schema exists in children prior to their learning to read.

**Text Types**

Studies of text types have found that narrative texts are more interesting to children than expository texts and superior learning occurs from texts that are more interesting (Hidi & Baird, 1986). Findings from these studies offer a confusing message when a narrative schema is the construct of interest. Because these studies measure learning from a text, the interestingness of the text contributes to the motivation of children to read more. Further, these studies compare texts in an expository format with those that fit the category of *informational story*, which further confound the findings, because informational story texts do not embed critical content information within the narrative, but include this information in balloons, charts, or labeled pictures. In such comparisons, interestingness can inhibit learning of important concepts when readers pay
more attention to the interesting details and ignore the main content ideas contained in the
text (Garner, Gillingham, & White, 1989; Wade & Adams, 1989).

Reading instruction has also traditionally been based on the belief that children
are able to comprehend narrative text more easily than expository text (Donovan, 1996).
For this reason a great amount of early instruction in reading is centered on narrative
texts, acknowledging that expository texts are organized around logical relations that
many young learners lack the knowledge and developmental level to comprehend. Yet,
literacy theorists (Chall, 1983; Hirsch, 1987) posit that the act of reading is much more
complicated than once was first thought and that there are many factors that contribute to
the readability of a text other than the type of discourse it uses.

Many reading specialists observe that background information is critical to a
development of reading ability (Chall, 1983). Most pieces of writing, such as books,
newspapers, or magazines, are written toward a general reader, and it is assumed that the
reader has a common level of background information. This background information
allows the reader to grasp concepts, comprehend the discourse, and get the gist of the
text. Comprehension is accomplished when the reader draws upon this background
information and relates the text on the page to an unstated context, which in turn gives
meaning to the ideas that are written.

Books and newspapers assume a common reader, that is, a person who knows the
things known by other literate persons in the culture. Obviously, such assumptions
are never identical from writer to writer, but they show a remarkably consistent.
Those who write for a mass public are always making judgments about what the
reader can be assumed to know, and the judgments are closely similar. Any reader
who doesn't possess the knowledge assumed in a piece he or she reads will in fact
be illiterate with respect to that particular writing. (Hirsch, 1987, p. 13)

Chall called this background information world knowledge, whereas Hirsch called
it cultural literacy.
This focus on background information during the act of reading has caused the older model for reading to be considered incomplete. The process of identifying words on the page, then assigning meaning to them, then combining the meanings of multiple words to assign meaning to sentences, and lastly combining sentence meanings to assign the meaning to a text, is a greatly oversimplified model of the manner in which readers comprehend texts (Glaser, 1985).

At the center of a newer model for reading is the schema, where the mind of the reader is considered to be very active, decoding written passages while at the same time filling in gaps and supplying background information for what is not written on the page. In this model, reading is a constructive process in which the reader is continuously inferring meanings, even though all the words are not stated. The words that state the explicit meaning of a piece of prose are but a small portion of the meaning established through the reader's relevant background knowledge. This background knowledge is organized cognitively by schemas, which are formed from our past experiences and assist us in assigning meaning to present experiences (Anderson & Pearson, 1984).

Because language arts instruction at the early elementary level begins with narrative texts, a narrative schema may be a product of this instruction. Yet, research into the active role of schemas in reading comprehension suggests that schemas exist prior to literacy instruction and assist in comprehension (Glaser, 1985). Other research on narrative schemas and literacy supports this position. Working with reading disabled adults (Gold, 1983), dyslexic readers (Weaver & Dickinson, 1982), and language impaired children (Graybeal, 1981), other studies have shown the existence of a narrative schema when recalling information from a passage read aloud. In addition, these studies
show identical narrative patterns of recall for reading impaired populations and reading populations. However, these studies measured recall for the components of narratives such as beginnings, settings, attempts to overcome obstacles, and the outcomes of the story; they were not concerned with content information as it is embedded within a narrative. Further, they did not examine the effects of an ability to organize information into a narrative format and content learning from a narrative instructional strategy.

Florida Writes

In Florida, the ability of a learner to organize information into a narrative format is measured in fourth grade by the Florida Writes Program. In 1990, the Florida Legislature passed a law requiring a writing assessment of fourth, eighth, and tenth grade learners in Florida. This is now known as the Florida Writing Assessment Program (Florida Writes) and is designed to measure a learner's proficiency in writing responses to designated topics within an assigned time-period. During the examination students are given a writing prompt and two, lined pieces of paper for their written response. They are allowed 45 minutes to plan and then write their responses. Responses are scored by trained evaluators, using a rubric that addresses four critical areas: focus, organization, support, and conventions. The organization of the written response addresses the structure of the writing such as whether the response has a beginning, middle, and an end, and whether there are relations among the points of the topic. The examination of fourth-grade students includes an assessment of their ability to write in the narrative form where narrative is defined as a type of written response that tells an imagined or real event or of an actual or fictional experience of the student (Florida Department of Education, 2003).

The ability to organize information into a narrative form is measured by the Florida Writes rubric. The rubric used for scoring the narrative written response of fourth
grade students creates a hierarchy of achievement levels with unscorable being the lowest level and a 6.0 being the highest level. Student scores below a 3.0 indicate little or no evidence of organization in the written response. A score of 3.0 or above indicates that an apparent organizational pattern exists in the written response. Scores of 3.0 and above also indicate the presence of other writing abilities such as word choice, sentence structure, command of language, clarity of expression, and the use of creative writing strategies.

**Narrative Interpretation**

Many theorists posit that human beings construct stories and interact with the stories of other humans in order to create meaning from their experiences. These stories are the primary means by which we communicate, as opposed to lawful formulations or logical arguments (Bruner, 1996; Sarbin, 1986).

White and Epston (1990) contend that human beings assign meaning to their lives through the plotting of experiences and story generation. Lives and relationships are therefore formed according to the nature of these stories, and conversations with the self and others take the form of the basic elements of story: a beginning, middle, and an ending. Behavior, then, is determined by the meaning ascribed to experiences and events, and interpretation is the method we use to receive the context of these experiences and events.

Because any statement that postulates meaning can be regarded as interpretive, these statements then become the result of inquiry, guided by internal maps or analogies. Through these analogies we scrutinize the world. They guide us in our questioning of experiences and our construction of reality. “The analogies that we use determine the very distinctions that we pull out from the world” (White & Epston, 1990, p. 5). White
and Epston use a text analogy in order to clarify this proposition, likening this process to the interaction of readers of a text. Because behavior no longer exists in the present by the time we attend to it, the meaning we assign to behavior exists across time. This is similar to the interaction of a reader with text; the meaning assigned to behavior, much like texts, exists across time, and the interaction of persons with that meaning is analogous to a reader interacting with a text.

This analogy also made it possible to conceive of the evolution of lives and relationships in terms of the reading and writing of texts, insofar as every new reading of a text is a new interpretation of it, and thus a different writing of it. Concluding that we cannot have direct knowledge of the world, social scientists proposed that what persons know of life they know through lived experience. In order to make sense of our lives and to express ourselves, experience must be storied and it is this storying that determines the meaning ascribed to experience. (White & Epston, 1990, p. 9)

White and Epston (1990) state that in the effort of making sense of our lives, we go through the task of ordering our experiences of events into sequences through time so that we are able to make a lucid text of ourselves and the world around us. The text we create by doing this is called a self-narrative. Put another way, persons establish their identities and their concept of self by way of a narrative configuration, making sense of life in its entirety through the manifestation of a straightforward and unfolding story (Polkinghorne, 1988).

As narratives exist through time, they serve as the mechanism for our structuring of experience, allowing us to become aware of a history as well as a sense for the future. Thus, the continuity of life gives meaning to the flow of memory, elevating selected experiences and discounting others (Bruner, 1986). Further, narratives possess an indeterminate quality complete with ambiguity, uncertainty, inconsistencies, contradictions, and gaps. The indeterminacy can be seen whenever one reads a good book.
and then views a cinematic version of that book, finding that one version can be strikingly different from the other. This difference is a result of the director’s unique interpretation and negotiating the indeterminacy by filling in the gaps. These gaps exist not only in literary texts, but also in our daily narratives. Much like a reader filling in the gaps of a novel with her imagination and lived experience, we also fill in the gaps of our lived stories with imagination and personal experiences (White, Epston, & Murray, 1992).

Event knowledge is a concept similar to the concept of narrative. Katherine Nelson (1986) proposes that humans experience the world as a series of ongoing events, which form the basic unit of representation. These events are composed of major scenes consisting of subsequences of actions. Nelson (1986) states, “event representations constitute knowledge of experience in the world and that cognitive processes operate on these rather than on the perceived world. Such operations, in turn, may lead to the construction of new forms of knowledge” (p. 189). Nelson defines events as change over time and characterizes them as dynamic and complex, incorporating objects as well as relations as part of a larger whole. They can be organized hierarchically as well as temporally/causally.

According to Bateson (1979), all knowledge comes as an act of interpretation. He refers to Korzybski’s maxim, “the map is not the territory,” to explain that the meaning we assign to experiences and events and our subsequent understanding of them is accomplished through our presuppositions and our network of premises that form our own maps of the world. Bateson compares these maps to patterns and suggests that our interpretation of events and experiences is a result of how the event matches our own
patterns. Further, events that do not fit our patterns are not selected for survival and will not exist as facts. Many theorists believe that these patterns exist in a narrative form.

It is highly probable that the narrative form is the most natural and the earliest process that we use to interpret experience, as well as organize information and our knowledge (Bruner, 1996). This is important for teaching in that understanding other minds, which is at the heart of the teacher/student interaction, is foremost an interpretive process. For Bruner, the ideal classroom would come equipped with all the trim, humor, and authenticity of real world situations, where students learn the roles persons play in these environments rather than learning mere disciplines. “Learning to be a scientist is not the same as learning science: It is learning a culture, with all the attendant non-rational meaning making that goes with it. The benefits of creating a classroom with the quirkiness of a laboratory, with humor and wild hypotheses are apparent” (Bruner, 1996, p. 132).

In Hans Georg Gadamer’s (1975) explanation of hermeneutics, he concludes that persons understand the world through the experience of their involvement and concern for events and people. Understanding then comes as a product of our being in the world, assuming our role as protagonist in an unfolding story. With this as a perspective, what practices, methods, relationships, or pedagogical principles should we see facilitating learning? If, as Bruner (1996) points out, narrative thought is indistinguishable from narrative text, where each one gives form to the other in the same way language is formed by thought and vice versa; what approach should educators use to facilitate learning? Further, what is the model to be used in the design of a learning environment that encompasses narrative?
Social Interpretation

Social learning theory (Bandura, 1977) states that the majority of individual behaviors are a result of observing others. When other humans model a behavior we code the information we observe from the model and use it as a guide for our own actions (Bandura, 1986). Narrative learning is compatible with this in the sense that when we observe others we are interacting with their personal narrative, allowing them to take on the role of a protagonist. It comes as no surprise that we learn from their modeled behavior by observing their actions. We see this in children when they choose to model their behaviors after heroes such as sports figures or movie actors. The model in this instance acts as a protagonist, one that we hold in high regard.

Vygotsky’s (1978) social-cultural development theory posits that all learning first occurs on a social level before being internalized. Development is first a function of a child’s need to interact with others. This interaction is called an interpsychological process and follows a pattern of internalizing these interactions, called intrapsychological processes. This movement from the interpsychological to the intrapsychological plane accounts for the development of voluntary attention, logical memory, and the formation of concepts. All the higher functions originate as actual relationships between individuals” (p. 57). This process described by Vygotsky is similar to the development of a self-narrative that is a product of an individual’s experiences and interactions with others. In addition, Vygotsky proposes that self-awareness of consciousness is the result of socialization, allowing for what he calls an inner speech.

Summary

Neil Postman (1995) states, “Without a narrative, life has no meaning. Without meaning, learning has no purpose. Without a purpose, schools are houses of detention,
not attention” (p. 7). If this is correct, then at what point does a school activity become a narratable activity? In a description of how the laboratory possesses narratological limits for research, Murray (1995) offers the following research analysis:

Female undergraduates were first given a test of self-esteem. Next, they worked on an involved conceptual task under one of two conditions: alone or in the presence of an audience. In the audience condition, two visitors sat behind the subject during her performance, occasionally whispering and shifting their chairs to remind her that she was being observed. All this was arranged to make the subject feel self-conscious. …In the audience condition, high and low-self-esteem subjects differed in their perceptions of their task performance. This is particularly noteworthy, since the actual performance of the groups did not differ. It appears then, that people interpret their behavior in a way that reinforces their characteristic expectation no matter what the outcomes really are. (p. 6)

In the above study, Murray concludes that what occurs in this situation is that no matter what behavioral outcomes occur in the laboratory, they have no direct bearing on identity in real life or the self-narrative of the subject. The participants who were not observed during the task did not incorporate their performance on the task into their self-narrative. Thus, the experiment exists as a reversible event. The issue that arises from this is how often does formal instruction in an academic setting resemble the laboratory’s reversible event. Further, Mandler (1984), having conducted research in the matter, has found evidence that memories not structured narratively are at greater risk of loss. Given this, what is the nature of the relationship of narrative to learning and to what extent does it affect processes such as knowledge gain and retention? In the present study the researcher sought to uncover evidence that informs these questions by investigating the effectiveness of a narrative instructional strategy.

An exploration of the various learning and perceptual theories and their relationship to narrative has been conducted in this chapter. In the following chapter a description of the experimental methods and procedures used in this study to isolate
narrative as a construct and examine its effect on learning for students with both a high and low level ability to organize information in a narrative form is provided.
CHAPTER 3
METHOD

The intent of this study was to research the effects of a narrative instructional strategy on acquisition and long-term retention of nutrition knowledge. Fourth grade students viewed two versions of a nutrition education video. One video contained the narrative characteristics described in the previous chapter: a plot structure, a source of conflict to produce causal connections, and background information about the main characters. The second video was similar to the first, with the scenes containing nutrition content information being identical, but the additional scenes that produce conflict, provide background information on the main characters, and establish a plot structure removed. An investigation was conducted on the effect that each type of strategy had on learning, specifically knowledge gain and retention. Secondly, the researcher examined whether learning differs between learners with a demonstrated ability to organize information into a narrative format and learners who have not demonstrated this ability, when both the narrative and expository strategy of instruction are used.

Two videos were specifically prepared for this study that contained identical nutrition information. Additionally, a nutrition-knowledge instrument was developed to measure the nutrition knowledge gains from viewing either video. This instrument was administered one week before viewing the video, immediately after viewing the video, and then one week later.
Instrument Development

A nutrition knowledge test was administered containing questions pertaining to the nutrition information and concepts addressed in the videos. Questions consisted of multiple-choice items and covered the topics of nutrients, carbohydrates, fats, sugars, energy in foods, vitamins, minerals, and the concept of a balanced diet. The nutrition-knowledge instrument served as the pretest, posttest, and retention test. To avoid contamination, students were not given the results of their performance on the instrument until after they had completed the instrument for the final time.

A set of questions was developed and reviewed by a panel with expertise in the areas of food science, human nutrition, and instruction and curriculum. One registered dietician served on the panel. The panel's input was used to assess the content validity of the test. The panel also evaluated the instrument's technical quality and assessed the instrument's ability to measure knowledge and understanding of the content information contained within the nutrition education videos. All questions generated for the instrument were submitted to the panel for review. Twenty-four questions were selected for use in the pilot study with defective questions being eliminated before the instrument's use in the final study.

Pilot Study

A pilot study was conducted at a separate elementary school in north-central Florida. The participants at the pilot school were fourth graders with similar demographic characteristics to the fourth graders who participated in the main study. The number of participants in the pilot study was 33. The purpose of the pilot study was to identify potential problems with the nutrition-knowledge instrument administration and to assess the reliability of the instrument.
Fourth grade students in the pilot study completed the nutrition-knowledge instrument immediately after viewing the narrative version of the nutrition education video. The researcher administered the multiple-choice, pencil-and-paper instrument to maintain consistency. The instructions on the instrument were read aloud to students and they were informed that they had 20 minutes to complete the instrument. Each item of the instrument had only one correct answer and was analyzed using SPSS.

A quantitative item analysis was conducted to determine each item's difficulty and discrimination index. The desired range of difficulty was set at \( p \) values between .20 and .80, with a desired average \( p \) value of .50. To ensure that questions answered correctly by a majority of students who do not know the material were eliminated, the acceptable range of discrimination was any D value that was positive. Next, a Cronbach's alpha test for internal consistency was calculated to provide a reliability estimate, resulting in a coefficient of .78. Four questions were eliminated from the instrument, with the final instrument consisting of 20 items.

**Main Study**

**Participants**

Fourth grade students from two elementary schools in north-central Florida were recruited to participate in the final study. Fourth graders were chosen because they were developmentally ready to receive instruction on the nutrition concepts contained within the videos and they had experienced multiple years of language arts instruction. In addition, the fourth graders had not received formal instruction on the nutrition concepts presented in the videos.

The total number of participants was 89 fourth graders from seven classes, including gifted students as well as low-performing students. The students were from a
wide range of ability levels and SES backgrounds. Further, students were not assigned to
the classrooms on the basis of developmental level or SES background. To examine the
interaction between the ability to organize information into a narrative format and the two
types of instruction being used in the study, two subsets were created with students who
had scored a 3.0 or higher on the narrative portion of the Florida Writes examination
forming one group and students who had scored lower than 3.0 forming the second
group.

Material

Two videos were used. A 24-minute video "Graham and the Carbohydrate" was
used in the narrative group. The video followed a fictional account of Graham, a fourth
grader at a school in the future, as he experiences a school day. He encounters friends, his
teacher, classmates, and an antagonist fourth grade student named Calvin. During
Graham's school day, he becomes involved in a classroom activity centered on a nutrition
problem. Graham and his friends must determine a proper balanced diet for a small space
creature called a "begosaur." During the solving of the problem, Graham and his friends
must determine which foods from a selection of foods will promote energy and health.
Although presented with obstacles, Graham and his friends achieve success.

An alternate form of this video was also shown to the expository group, with
aspects of the antagonist, Calvin, edited out, as well as certain scenes that establish a
back-story about the main character, Graham. None of the deleted scenes contained
information related to the educational content of the video on nutrition, however, the
editing removed aspects of the narrative such as the conflict with the antagonist and the
background information on the protagonist. Further, by eliminating the background
information on the main character, the conflict, and the resolution of the story, a clearly
identifiable plot structure was eliminated. In essence, the video lost its narrative characteristics and became a temporal series of events organized around a classroom activity.

The video was specifically created for the present study, written so that the elimination of the narrative qualities of the program would not alter the presentation of the content information. Further, because it was an animated video involving characters of the same age as the participants, it was believed that the entertainment qualities of the two versions of the program were equivalent. In both versions of the video the pacing and the amount of content were suited for fourth grade students.

The expository version of the video---titled "A Classroom in the Future"---began with four students entering their classroom and then followed them as they participated in a classroom activity involving a nutrition question. In this version, the four students were exposed to nutritional knowledge and then had to apply that knowledge while participating in an academic exercise. There was no conflict generated by an antagonist and there was no clear beginning where the characters are introduced with background information and conflict is established, a clear middle where the conflict is elevated and the characters attempt to overcome it, or a clear ending where a resolution occurs or justice is served.

The narrative version of the video---titled "Graham and the Carbohydrate"---contained all of the actions and content the expository version contained, plus additional scenes that established elements of a narrative. It had scenes at the beginning that established some background on the main character and information that further established the setting. Conflict was established at the beginning through an introduction
to an antagonistic bully. A middle was established when the bully purposefully hindered the four students as they were solving the nutrition problem, thus elevating the conflict. An ending was established when the bully received his just reward for his nasty behavior. None of the scenes added to the narrative version contained any of the nutrition content information. Further, the scenes that did contain content information were identical for both versions as was the sequence in which they were viewed.

Procedure

Students were randomly assigned to one of two treatments. One treatment group (Narrative Group) viewed the version of the video containing the narrative characteristics, while the second group (Expository Group) viewed the version of the video that had the narrative aspects removed. The pretest was administered to participants one week before viewing the nutrition videos to avoid the possibility of the instrument providing a perceptual set for learners while watching the video. The researcher administered the instrument on each occasion to provide consistency among test occasions and read the instructions of the instrument aloud to students before each administration. One week later, both groups were instructed that they would be watching a nutrition education video and they would be tested to determine how well they learned from the video. Once students received their instructions they were given an opportunity to ask questions. They then viewed the video assigned to their group. Immediately after viewing their respective video, the students again completed the nutrition knowledge instrument to assess knowledge acquisition. Then, one week after viewing the videos, the nutrition knowledge instrument was administered to students a third time to assess retention. Only students who participated in all three observations had their scores included in the data analysis. To avoid contamination, the researcher waited until after
collecting the instrument for the final time to go over the instrument with the students, noting the correct responses for each item and answering questions about the nutrition content of the video. All procedures took place during regularly scheduled class periods. Information regarding each participant's ability to organize information into a narrative format, as demonstrated by Florida Writes scores, was obtained from student records.

Research Design

After random assignment, a pretest was administered to participants to assess prior knowledge of nutrition concepts and for the analysis of differences between pre-treatment groups. A \( T \)-test was conducted on the pretest scores to analyze for these differences. No significant differences were found between treatment groups, so the treatment and subsequent measurements proceeded on the assumption that selection bias had been controlled (Wiersma, 1995). The pretest also served as the baseline measure of prior knowledge of the nutritional content and was used as a covariate for statistical control (Campbell & Stanley, 1963). The design of the study followed a \( (R-O_1-X-O_2-O_3) \) sequence. Analyses of covariance (ANCOVA) were used to test for significant mean differences between groups on the posttest and the retention test.

The independent variables for the main study were the version of the video viewed by the students in the classroom, which had two levels (narrative and expository), and the ability of students to organize information into a narrative format as demonstrated by Florida Writes scores, which had two levels (below a score of 3.0 and scores at or above 3.0). Two quantitative measures were used as dependent variables for this study: a posttest to measure knowledge acquisition and a retention test to measure retention. The dependent measure was designed to assess student learning in the content area of nutrition. ANCOVA was used to determine the effect of the independent treatment
variable (video version) on the dependent variable (main effect) for both knowledge acquisition and knowledge retention. The interaction effect of the independent treatment variable (video version) with the second independent variable, which is narrative organizational ability, was analyzed using a 2 x 2 ANCOVA for knowledge acquisition and knowledge retention.

**Hypotheses**

The following hypotheses were tested using analysis of covariance.

**Hypothesis 1.** There is no significant difference in total scores on the nutrition knowledge acquisition test (posttest) between the narrative group and the expository group due to type of treatment (narrative or expository type of instruction).

**Hypothesis 2.** There is no significant interaction between treatment and narrative organizational ability for total scores on the nutrition knowledge acquisition test (posttest).

**Hypothesis 3.** There is no significant difference in total scores on the nutrition knowledge retention test between the Narrative Group and the Expository Group due to type of treatment (narrative or expository type of instruction).

**Hypothesis 4.** There is no significant interaction between treatment and narrative organizational ability for total scores on the nutrition knowledge retention test.

**Data Analysis**

The effect of the treatment and narrative organization ability was determined using Statistical Package for the Social Sciences (SPSS) to assess knowledge acquisition and long-term retention. Descriptive statistics for the groups representing each combination of factors were computed. Then, analyses of covariance (ANCOVA) were carried out to determine whether there were significant main effects and interaction
effects, and, in the case of rejecting a null hypothesis, post hoc multiple-comparison tests were conducted. All hypotheses were measured against a probability value of $p < .05$ in order to determine significant differences.

**Summary**

In this chapter, the description of the methods, materials, and the participants in this study were presented. The aim of this study’s research design was to isolate the construct of a narrative instructional strategy so that an investigation of its effects on knowledge acquisition and knowledge retention could detect any differences. The next chapter presents the results of the investigation.
CHAPTER 4
DATA ANALYSIS

The purpose of this study was to compare the effects of a narrative instructional strategy on learning and retention, when nutrition information and concepts are embedded into a narrative educational video. The researcher examined the differences when information was presented through either an expository instructional strategy or in a narrative instructional strategy to determine whether the characteristics of each type of strategy had an effect on learning and retention. Analysis of covariance was used for the learning and the retention sections of the study. Additionally, whether learning from a narrative instructional strategy would be influenced by a learner’s narrative organizational ability was examined. A 2 x 2 factorial analysis of covariance was used for this section of the study. A pretest was used as the baseline measure.

Results

Analyses of covariance were used to analyze the data. Students were randomly assigned to either a Narrative Group or an Expository Group. An independent samples T-test was conducted on pretest scores to analyze the differences in pre-treatment groups. An alpha level of .05 was used for the statistical test. The effect of treatment group was not statistically significant, $t (80) = -.374, p = .709$ (two-tailed). This suggested that randomization was effective at controlling selection bias. ANCOVA summary tables and descriptive statistics are provided for means and standard deviations. Data were collected using an experimental research design, using a 20-item nutrition knowledge test as the dependent measure and the covariate.
Descriptive Data

The design of this study incorporated a pretest, treatment, posttest, and a retention test. For this study, 138 fourth grade students at two schools were recruited as participants, with 89 students consenting to participate. Students were randomly assigned to either the Narrative group (n=44) or the Expository group (n=45). Seven students had missing data due to absences and were dropped from the study, resulting in a final sample size of 82 students, with 38 students in the Narrative group and 44 students in the Expository group. Additionally, students were categorized as either having demonstrated narrative organizational ability (Narrative Organization), as evidenced by scores of 3.0 or higher on the Florida Writes exam, or not having demonstrated narrative organizational ability (No Narrative Organization), as evidenced by a score less than 3.0 on the Florida Writes exam. Only 45 of the students in the sample took the narrative portion of the Florida Writes exam, with 41 students scoring 3.0 or higher, and 4 students scoring below 3.0. Tables 1 and 2 provide information on all the participants completing the study as well as the means and standard deviations for the Narrative and Expository groups, and the Narrative Organization and No Narrative Organization groups.

Table 1
Descriptive Data of Pretest, Posttest, and Retention Test for Treatment Group

<table>
<thead>
<tr>
<th></th>
<th>Pretest</th>
<th></th>
<th>Posttest</th>
<th></th>
<th>Retention Test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Treatment Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narrative</td>
<td>38</td>
<td>8.97</td>
<td>2.58</td>
<td>38</td>
<td>13.84</td>
<td>4.46</td>
</tr>
<tr>
<td>Expository</td>
<td>44</td>
<td>9.18</td>
<td>2.45</td>
<td>44</td>
<td>15.00</td>
<td>3.88</td>
</tr>
</tbody>
</table>
Table 2
Descriptive Data of Pretest, Posttest, and Retention Test for Narrative Organizational Ability

<table>
<thead>
<tr>
<th>Organizational Ability Group</th>
<th>Pretest</th>
<th></th>
<th></th>
<th>Posttest</th>
<th></th>
<th></th>
<th>Retention Test</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
<td>N</td>
<td>M</td>
<td>SD</td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Narrative</td>
<td>41</td>
<td>9.56</td>
<td>2.31</td>
<td>41</td>
<td>14.88</td>
<td>3.32</td>
<td>41</td>
<td>13.59</td>
<td>3.56</td>
</tr>
<tr>
<td>No Narrative</td>
<td>4</td>
<td>6.00</td>
<td>2.94</td>
<td>4</td>
<td>9.50</td>
<td>5.26</td>
<td>4</td>
<td>8.50</td>
<td>4.43</td>
</tr>
</tbody>
</table>

Data Analysis

Analyses of covariance were used to test for statistically significant differences on the dependent measures. Because the ANCOVA controls for differences between groups by using a continuous blocking variable, or covariate, statistical power is increased. The assumptions that accompany this additional power were made based on investigation of the data and research design. The assumption that individual scores on the covariate and dependent variable were independent of the scores for other subjects was satisfied through random assignment. The assumptions of normality, homogeneity of variances, and linearity were satisfied through careful investigation of the scatter-plots for each variable. By using ANOVA to test interaction terms, the assumption of homogeneity of regression slopes was satisfied. This interaction was not significant, suggesting that random assignment was successful. A test of the interaction between the covariate and the treatment was conducted to satisfy the assumption of parallel slopes. The assumption of no measurement error was satisfied through pilot testing the instrument to obtain an alpha of .78.
Tests of Hypotheses

**Hypothesis 1.** There is no significant difference in total scores on the nutrition knowledge acquisition test (posttest) between the narrative group and the expository group due to type of treatment (narrative or expository type of instruction).

This analysis resulted in an $F$ (1, 79) of 1.459. This $F$ statistic is not significant at $(p < .05)$, thus, this null hypothesis was not rejected (see Table 3). That is, the posttest scores for knowledge acquisition in the narrative group were not statistically different from those in the expository group.

<table>
<thead>
<tr>
<th>Source</th>
<th>SS(Type III)</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>20.719</td>
<td>1</td>
<td>20.719</td>
<td>1.459</td>
<td>.231</td>
</tr>
<tr>
<td>Covariate</td>
<td>259.00</td>
<td>1</td>
<td>259.00</td>
<td>18.235</td>
<td>.000</td>
</tr>
<tr>
<td>Error</td>
<td>1122.052</td>
<td>79</td>
<td>14.203</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18562.00</strong></td>
<td><strong>82</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hypothesis 2.** There is no significant interaction between treatment and narrative organizational ability for total scores on the nutrition knowledge acquisition test (posttest).

Because the number of students that completed the narrative portion of the Florida Writes examination was smaller than the overall sample, a segment of the sample was excluded from investigation of this hypothesis. The sample size for this analysis was $n=45$ versus $n=82$ for the overall sample. An analysis of covariance was conducted, resulting in an $F$ (1, 40) of .776 for the interaction effect for treatment and narrative organizational ability (see Table 4). The $F$ ratio is not significant at $(p < .05)$, leading the researcher to not reject this null hypothesis.
Table 4
Source Table of Analysis of Covariance for Knowledge Acquisition, Treatment by Narrative Organizational Ability

<table>
<thead>
<tr>
<th>Source</th>
<th>SS(Type III)</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>3.767</td>
<td>1</td>
<td>3.767</td>
<td>.319</td>
<td>.576</td>
</tr>
<tr>
<td>Narrative Organization</td>
<td>48.122</td>
<td>1</td>
<td>48.122</td>
<td>4.074</td>
<td>.050</td>
</tr>
<tr>
<td>T x N.O.</td>
<td>9.170</td>
<td>1</td>
<td>9.170</td>
<td>.776</td>
<td>.384</td>
</tr>
<tr>
<td>Covariate</td>
<td>35.947</td>
<td>1</td>
<td>35.947</td>
<td>3.042</td>
<td>.089</td>
</tr>
<tr>
<td>Error</td>
<td>472.654</td>
<td>40</td>
<td>11.816</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 3. There is no significant difference in total scores on the nutrition knowledge retention test between the Narrative Group and the Expository Group due to type of treatment (narrative or expository type of instruction).

This analysis resulted in an $F(1, 79)$ of .763. This $F$ statistic is not significant at ($p < .05$), thus, this null hypothesis was not rejected (see Table 5). That is, the retention test scores for knowledge retention in the narrative group were not statistically different from those in the expository group.

Table 5
Source Table of Analysis of Covariance for Knowledge Retention and Treatment

<table>
<thead>
<tr>
<th>Source</th>
<th>SS(Type III)</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>9.213</td>
<td>1</td>
<td>9.213</td>
<td>.763</td>
<td>.385</td>
</tr>
<tr>
<td>Covariate</td>
<td>302.365</td>
<td>1</td>
<td>302.365</td>
<td>25.054</td>
<td>.000</td>
</tr>
<tr>
<td>Error</td>
<td>953.962</td>
<td>79</td>
<td>12.075</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1270.500</td>
<td>82</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 4. There is no significant interaction between treatment and narrative organizational ability for total scores on the nutrition knowledge retention test.
As with the investigation of knowledge acquisition and an interaction between treatment and narrative organizational ability, the number of students that completed the narrative portion of the Florida Writes examination was smaller than the overall sample, causing a portion of the sample to be excluded from investigation of this hypothesis. The sample size for this analysis was n=45 versus n=82 for the overall sample. An analysis of covariance was conducted, resulting in an $F(1, 40)$ of .759 for the interaction effect for treatment and narrative organizational ability (see Table 6). The $F$ ratio is not significant at ($p < .05$), leading the researcher to not reject this null hypothesis.

**Table 6**
*Source Table of Analysis of Covariance for Knowledge Retention, Treatment by Narrative Organizational Ability*

<table>
<thead>
<tr>
<th>Source</th>
<th>SS(Type III)</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>2.545</td>
<td>1</td>
<td>2.545</td>
<td>.223</td>
<td>.639</td>
</tr>
<tr>
<td>Narrative</td>
<td>25.091</td>
<td>1</td>
<td>25.091</td>
<td>2.201</td>
<td>.146</td>
</tr>
<tr>
<td>Organization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T x N.O.</td>
<td>8.657</td>
<td>1</td>
<td>8.657</td>
<td>.759</td>
<td>.389</td>
</tr>
<tr>
<td>Covariate</td>
<td>89.844</td>
<td>1</td>
<td>89.844</td>
<td>7.880</td>
<td>.008</td>
</tr>
<tr>
<td>Error</td>
<td>456.058</td>
<td>40</td>
<td>11.401</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Further Investigation**

Given the small number in the cell containing those students categorized as not having demonstrated narrative organizational ability (n=4), a further investigation of the data was conducted. Instead of using a nominal measurement for this variable, two analyses were conducted with narrative organizational ability as an interval measurement. The numeric scores students received on the narrative portion of the Florida Writes were used. Table 7 contains the data for these scores.
Table 7
Descriptive Data for Florida Writes Narrative Scores

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>M</th>
<th>STD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrative Scores</td>
<td>45</td>
<td>2.0</td>
<td>6.0</td>
<td>4.144</td>
<td>.986</td>
</tr>
</tbody>
</table>

The first analysis using this change of the variable type for narrative organizational ability was an investigation of the interaction between treatment and narrative organizational ability for knowledge acquisition. An analysis of covariance was conducted, resulting in an $F$ $(5, 30)$ of 1.241 for the interaction effect for treatment and narrative organizational ability (see Table 8). The $F$ ratio is not significant at ($p < .05$), leading the researcher to conclude that there is no significant interaction effect for knowledge acquisition.

Table 8
Source Table of Analysis of Covariance for Knowledge Acquisition, Treatment by Narrative Organizational Ability, Using an Interval Scale

<table>
<thead>
<tr>
<th>Source</th>
<th>SS(Type III)</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>.716</td>
<td>1</td>
<td>.716</td>
<td>.066</td>
<td>.799</td>
</tr>
<tr>
<td>Narrative Organization</td>
<td>153.002</td>
<td>7</td>
<td>21.857</td>
<td>2.012</td>
<td>.087</td>
</tr>
<tr>
<td>T x N.O.</td>
<td>67.393</td>
<td>5</td>
<td>13.479</td>
<td>1.241</td>
<td>.315</td>
</tr>
<tr>
<td>Covariate</td>
<td>16.393</td>
<td>1</td>
<td>16.393</td>
<td>1.509</td>
<td>.229</td>
</tr>
<tr>
<td>Error</td>
<td>325.887</td>
<td>30</td>
<td>10.863</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The second analysis using this change of the variable type for narrative organizational ability was an investigation of the interaction between treatment and narrative organizational ability for knowledge retention. An analysis of covariance was conducted, resulting in an $F$ $(5, 30)$ of .774 for the interaction effect for treatment and narrative organizational ability (see Table 9). The $F$ ratio is not significant at ($p < .05$),
leading the researcher to conclude that there is no significant interaction effect for knowledge retention.

Table 9
Source Table of Analysis of Covariance for Knowledge Retention, Treatment by Narrative Organizational Ability, Using an Interval Scale

<table>
<thead>
<tr>
<th>Source</th>
<th>SS(Type III)</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>2.091</td>
<td>1</td>
<td>2.091</td>
<td>.193</td>
<td>.664</td>
</tr>
<tr>
<td>Narrative Organization</td>
<td>121.501</td>
<td>7</td>
<td>17.357</td>
<td>1.602</td>
<td>.173</td>
</tr>
<tr>
<td>T x N.O.</td>
<td>41.932</td>
<td>5</td>
<td>8.386</td>
<td>.774</td>
<td>.576</td>
</tr>
<tr>
<td>Covariate</td>
<td>74.871</td>
<td>1</td>
<td>74.871</td>
<td>6.911</td>
<td>.013</td>
</tr>
<tr>
<td>Error</td>
<td>325.008</td>
<td>30</td>
<td>10.834</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summary

The results of this study indicate that there are no statistical differences in knowledge acquisition scores between the narrative and the expository instructional strategies used in the nutrition education videos. The analysis of covariance also shows that there are no statistical differences in knowledge retention scores between the narrative and expository instructional strategies used in the videos. Additionally, when students are categorized as either having narrative organizational ability or not having this ability, there is no statistically significant interaction between this ability and treatment for both knowledge acquisition and knowledge retention scores.

The purpose of this chapter was to report the statistics related to the study, including descriptive data and analyses of the hypotheses. The implications of the results, as well as considerations for future research will be addressed in the next chapter.
CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

This study was designed to compare the effects of a narrative instructional strategy on learning and retention, when nutrition information and concepts are embedded into a narrative educational video. A particular interest was the differences when information is delivered through either an expository instructional strategy or a narrative instructional strategy to determine whether the characteristics of each type of strategy have an effect on learning. The narrative video included hermeneutical characteristics that differentiated it from the expository video, and the activities within the narrative video followed a narrative plot structure. The expository video portrayed a classroom activity centered on nutrition, with no narrative plot structure or hermeneutical characteristics other than those of the classroom activity.

Another focus of this study was the interaction effects of a narrative instructional strategy and the ability of learners to organize information into a narrative format. An investigation was conducted on the interaction between type of instructional strategy and the ability of learners to organize information narratively, as demonstrated by scores on the Florida Writes examination, to determine if this affects learning and retention.

Analyses of covariance were conducted to examine the effects of instructional strategy and narrative organizational ability. The findings are stated below.
Findings

**Hypothesis 1.** There is no significant difference in total scores on the nutrition knowledge acquisition test (posttest) between the narrative group and the expository group due to type of treatment (narrative or expository type of instruction).

This null hypothesis was not rejected.

**Hypothesis 2.** There is no significant interaction between treatment and narrative organizational ability for total scores on the nutrition knowledge acquisition test (posttest).

This null hypothesis was not rejected.

**Hypothesis 3.** There is no significant difference in total scores on the nutrition knowledge retention test between the Narrative Group and the Expository Group due to type of treatment (narrative or expository type of instruction).

This null hypothesis was not rejected.

**Hypothesis 4.** There is no significant interaction between treatment and narrative organizational ability for total scores on the nutrition knowledge retention test.

This null hypothesis was not rejected.

Discussion

**Narrative Instructional Strategy**

For the variable of instructional strategy, there were no significant differences between the knowledge acquisition scores for students viewing the narrative educational video and the students viewing the expository educational video. Although the posttest scores for the Expository Group were higher, when adjusted for the covariate, the differences were not significant, indicating that these differences were random fluctuations. Additionally, there were no significant differences between the knowledge
retention scores for students viewing the narrative educational video and the students viewing the expository educational video. Once again, although the retention scores for the Expository Group were higher, any differences should be considered random fluctuations.

The first research question specifically asked: “Does a narrative instructional strategy better enhance a student's learning of content information than an expository strategy?” The intent of this question was to determine whether a narrative instructional strategy would increase a students’ knowledge acquisition when educational concepts are embedded within a narrative. While previous research (Mandler, 1984; Rabinowitz & Mandler, 1983) has demonstrated that information presented in a narrative format is recalled better than information that is organized taxonomically, this research focused on free recall of item lists and not knowledge acquisition of subject matter concepts. It is possible that narrative produces better recall of item information, yet does not enhance the learning of concepts.

While the findings of this study seem to suggest that fourth grade students do not learn subject matter concepts presented through a narrative instructional strategy better than an expository instructional strategy, there are several reasons that could have influenced these results. One explanation may be that this study used an overly narrow definition of narrative. Included in this study’s definition of narrative are causal connections. The narrative video in this study included temporal connections as well as causal connections created by an antagonist, while the events in the expository video were a series of everyday, classroom activities, sequenced exclusively on temporal connections, with no characters portraying an antagonist role. Waters (1987) found that
older learners and adults rely more on the causal connections for remembering, while younger learners rely more on the temporal connections. It is possible that the fourth graders in this study relied on the temporal connections contained in both videos for processing information, resulting in no significant differences on knowledge acquisition scores between treatment groups. Perhaps the greater reliance on causal connections occurs at a higher grade level than the one chosen for this study.

Another reason for no significant differences in knowledge acquisition scores may be due to instrumentation. Instead of using free recall of the information contained in each video, the 20-item, nutrition knowledge instrument facilitated cued recall for each of the concepts presented in the videos. It is possible that a narrative schema facilitates free recall better than other types of schemas (Mandler, 1984), yet does not produce significantly different results when learners are cued for concept information.

The second research question specifically asked: “Does a narrative instructional strategy better enhance a student's long-term retention of content information than an expository strategy?” Because learning is often associated with retention of information and knowledge, the intent of this question was to determine whether a narrative instructional strategy would increase retention of educational concepts when those concepts are embedded within a narrative. As with knowledge acquisition, the lack of significant differences in retention scores suggests that a narrative instructional strategy does not produce better retention of educational concepts for the fourth graders in this study.

**Narrative Organizational Ability**

There was no significant interaction between narrative organizational ability and instructional strategy for knowledge acquisition scores. Additionally, there was no
significant interaction between narrative organizational ability and instructional strategy for knowledge retention scores. Although the posttest and retention scores for students who demonstrated narrative organizational ability were higher, the differences were not significant when using the pretest as a covariate, indicating that any differences were random fluctuations.

The third research question specifically asked: “Does the ability to organize information narratively influence a student's learning of content information when a narrative instructional strategy is used?” Because it is possible that learners who demonstrate achievement in this area, evidenced by their ability to organize information narratively on a written examination, will learn more effectively from a narrative instructional strategy than those learners who have not demonstrated this ability, the intent of this research question was to determine whether this ability influenced knowledge acquisition when a narrative instructional strategy was used. Although there is evidence for improved recall from narratives when learners use more causal connections in their narrative organization (Wimmer, 1979), and the range of narrative scores on the Florida Writes examination indicates varying narrative organizational ability among the participants in this study, the findings of this study suggest that this observed ability has no significant influence on learning from a narrative instructional strategy.

It should be noted that the low number of students in this study that had an observed Florida Writes score below 3.0 on the narrative portion of the exam presents problems to the power of this statistical analysis. The large discrepancy of the group sizes between those students with a score at or above 3.0 (n=41) and those students with below 3.0 (n=4) increases Type II error and decreases the ability of the statistical analysis to
correctly reject a false null hypothesis. The low number of students with demonstrated narrative organizational ability also prohibits typical strategies for adjusting for unequal cell sizes, such as randomly deleting cases to equalize cell sizes or adjusting all main effects and interactions for one another, and adjusting for effects of covariates.

Further investigation, using the narrative scores from the Florida Writes exam as a continuous, interval scale, instead of a nominal scale, also produced no significant interactions. The findings suggest that the demonstrated organizational ability of students in this study had no mediating effect on knowledge acquisition from either a narrative or an expository instructional strategy.

The fourth research question specifically asked: “Does the ability to organize information narratively influence a student's long-term retention of content information when a narrative instructional strategy is used?” The intent of this research question was to determine whether narrative organizational ability influenced knowledge retention when a narrative instructional strategy was used. As with the analysis of the influence that narrative organizational ability has on knowledge acquisition when a narrative instructional strategy is used, the low number of students classified as not having demonstrated narrative organizational ability prohibited the statistical analysis from having the desired power to correctly reject a false null hypothesis. In addition, further investigation, using the narrative scores from the Florida Writes exam as a continuous, interval scale, instead of a nominal scale, also produced no significant interaction. The findings suggest that the demonstrated narrative organizational ability of students in this study had no moderating effect on knowledge retention from either a narrative or an expository instructional strategy.
A potential explanation for the lack of any significant interaction between instructional strategy and narrative organizational ability is that the Florida Writes narrative scores do not accurately reflect the presence of a narrative schema. Because the Florida Writes exam measures communication skills along with the ability to organize information into a narrative format, a student may have a well-defined narrative schema, yet not be able demonstrate this because of poor communication skills. Additionally, very few of the students scored below a 3.0 on the Florida Writes narrative exam (n=4), which indicates that a majority of students in the sample (n=41), those scoring 3.0 or higher on the exam, demonstrated narrative organizational ability.

Implications

This study’s findings suggest that there is no difference in knowledge acquisition or retention when either a narrative or an expository instructional strategy is used. These findings appear to inform previous research which indicates that learners are less adept at processing concept information when presented with seductive details (Garner, Gillingham, & White, 1989). Seductive details are interesting words, sounds, visuals, or vivid information that is added to instructional materials, yet are unrelated to the content of the instruction. Prior research has also suggested that seductive details interfere with knowledge acquisition by priming inappropriate schemas, or by distracting the learner (Harp & Mayer, 1998). The results of studies that found seductive details interfere with learning (Garner et al., 1989; Harp & Mayer, 1998) used text for the presentation of abstract as well as concrete concepts. Because of this, perhaps dual coding theory provides an explanation for this phenomena.

Dual coding theory proposes that there are two systems for processing information, a verbal system that is specialized for handling language input, and a non-
verbal system for handling objects and events encountered in the world. This non-verbal system is often referred to as the image system. Both systems can work independently and they can work in an integrated manner. Information that is coded by both systems is theorized to produce better learning, increased comprehension, and an improved memory trace. When the language of a text is more concrete, it evokes better mental images, involves both systems, and produces greater learning than abstract language. Sadoski, Goetz, & Fritz (1993) propose that seductive details do not lure learners away from uninteresting, abstract concepts, nor do they evoke inappropriate schemas, but rather the learner tends to process the concrete language used to convey the seductive detail more effectively than the abstract language used to present content. This accounts for the better recall of the seductive detail than the recall of content. It is possible that learners are attending more to comprehensible language, thus producing better memory for the information that it conveys.

Unlike previous research of seductive detail, which focused on learning from text, video was used in this study. It appears that the additional details included in the narrative educational video used in this study did not interfere with knowledge acquisition or retention. This may support the proposition (Sadoski, et al., 1993) that dual coding theory offers a legitimate explanation for the effects of seductive detail. Both the additional details in the narrative educational video and the nutrition concepts conveyed in both videos were presented through language (dialogue) and imagery. It is plausible that because both of the dual-coding-theory systems were utilized to convey the educational content, the seductive details did not interfere with knowledge acquisition or retention.
It is important to note that both videos in this study were presented without any additional instructional methods other than the ones contained within each video. This was done so that the construct of interest could be isolated from confounding variables. The average score on knowledge retention for the Narrative group was 13.05, and the average score for the Expository group was 13.89. These scores represent a lower than desired retention of educational concepts and highlight the importance of using effective instructional practices when using video in the classroom. Because video instruction is typically a one-time learning event that occurs at a fixed pace, it is not sufficient to maximize learning when it is the only learning activity. For instruction to be most effective at causing learning to occur, multiple principles should be employed. Active, appropriate practice that is distributed over time should be employed so that students use information and associate the activity with learning, promoting a greater likelihood of recalling information (Yelon, 1996). Further, television has frequently been disparaged as an instructional medium, with many practitioners and experts positing that it does not allow for the deep processing of information. Television is often seen as an entertainment medium rather than an educational medium, particularly by younger learners, and as such the depth of processing is inhibited (Salomon, 1984). Yet learners can be assisted and even instructed to process information presented through television more deeply (Meringoff, 1980). To do this educators should prepare learners for the instruction by giving them perceptual sets to guide their attentive processes, advance organizers to promote deeper processing of material, or reviewing previously learned information to assist learners with relating new material to old material and developing a need to know. Other instructional practices that should be used include stating the objectives of the
video lesson, conducting follow-up activities and questioning, and addressing any new vocabulary contained in a video before its presentation.

**Recommendations**

The findings of this study have generated some noteworthy ideas about the characteristics of narrative, the effects of a narrative instructional strategy, and the role of narrative details in the learning process. These ideas may be of interest to future researchers and are presented here as recommendations for future studies.

1. In this study, narrative was defined to include specific characteristics of narrative, such as a plot generated by causal connections. These causal connections are what gave the narrative video used in this study a three-act structure. Perhaps fourth graders rely more on the temporal characteristics of narrative in the establishment of schemata, and less on the causal relations of events in a plot line. Future investigations of a narrative instructional strategy with young learners could incorporate a more broad definition of narrative, emphasizing the temporal connections. By relaxing the definition, the characteristics of narrative that contribute to learning may be more easily identified.

2. Some researchers have researched the levels of importance of objects and events contained within narratives (Lorch, et al., 1987). The levels of importance of events and objects within the educational videos used in this study may have contributed to learning specific concepts better than others. A future study could recruit fourth graders from a separate school to rate the events and objects contained within the two videos according to levels of importance. This information could be used to measure the correlation between level of importance and the number of students answering each corresponding instrument item correctly. Further, it would be informative to understand how the levels of importance for events and objects that appear in both the narrative and the expository videos vary.

3. It is possible that the fourth grade students in this study were not old enough to begin relying on the causal connections in the narrative video. A future investigation, using the same materials and instrument, with students from either the fifth or sixth grades may reveal differences in knowledge acquisition and retention from the use of a narrative instructional strategy. It may also provide evidence for the age at which learners begin to rely more on causal connections than on temporal connections.

4. This study did not incorporate any message design strategies into the educational videos, such as attention cueing devices or advance organizers. A future investigation could incorporate these techniques into the videos and examine the effects these message design strategies have on learning from a narrative
instructional strategy. It is possible that using these strategies could interfere with a narrative schema by luring the learner’s attention away from the flow of the narrative. Strategies such as using captions, arrows, and highlights to direct attention could disrupt the learner’s engagement with the narrative flow of information.

5. This investigation focused on the effects of an instructional strategy in the cognitive domain. If, as this study’s findings suggest, there are no significant differences in knowledge acquisition and retention between a narrative instructional strategy and an expository instructional strategy, then further investigations in the affective domain can proceed with the assumption that knowledge acquisition and retention are equal for each strategy and are not a confounding variable. An investigation of a narrative instructional strategy’s effects on the affective domain may provide evidence as to whether a narrative instructional strategy influences attitudes or changes behaviors. A possible investigation using this study’s materials could inform nutrition educators about how a narrative instructional strategy affects the nutritional awareness and eating habits of children.

6. The knowledge acquisition and retention measurements used in this study represent the lower levels of Bloom’s taxonomy of educational objectives (Bloom, Mesia, & Krathwohl, 1964). The levels measured include knowledge, comprehension, and application. Future investigations could be designed to measure the higher levels, such as analysis, synthesis, and evaluation to look for significant differences between a narrative instructional strategy and an expository instructional strategy.

7. In order to isolate the variables of interest, this study used video for the delivery of instruction. By doing so this prevented other instructional methods from interacting with the two instructional strategies used. However, other instructional strategies such as giving learners perceptual sets, advance organizers, or using strategies to increase motivation may interact differently with a narrative instructional strategy than with an expository instructional strategy. A future investigation could examine these interactions to determine how this affects learning.

Summary

Over the years designers of educational videos have often used narratives to make their products more appealing to viewers. The last couple of decades have seen educational software developers use narratives to engage learners and maintain interest. All this has been done without any clear evidence to suggest that using a narrative instructional strategy either enhances or inhibits learning. The effective design of any instruction, whether it is delivered via video, through instructional software, over the
internet, or conducted in face-to-face learning environments needs the practical guidance provided by research. This study was intended to fill a small part of this pursuit. It is hoped that the results of this study can help inform designers as well as highlight possible avenues for future researchers.
Nutrition Quiz

Circle the answer to each question.

1. The parts of food such as protein, fats, sugars, vitamins, carbohydrates, and minerals are called
   a. elements
   b. food particles
   c. nutrients
   d. food substances

2. Which of the following is a type of carbohydrate?
   a. fat
   b. sugar
   c. vitamin
   d. protein

3. Which of the following foods contain the highest amount of carbohydrates?
   a. a banana
   b. a potato
   c. a candy bar
   d. a slice of bread

4. Which of the following foods contain the least amount of carbohydrates?
   a. a banana
   b. a potato
   c. a candy bar
   d. a slice of bread

5. Which of the following meals would be best to eat if you were training to run a race?
   a. two candy bars
   b. a variety of foods such as fruits, vegetables, breads, and cereals
   c. two medium sized potatoes
   d. four candy bars

6. Oxygen is needed in the body for which of the following purposes?
   a. to help you eat more food
   b. to burn energy in the muscles
   c. to help you make fat
   d. to turn carbohydrates into fat
7. If you were to eat too many carbohydrates, what would your body do?
   a. turn the carbohydrates into protein
   b. turn the carbohydrates into vitamins
   c. turn the carbohydrates into fat
   d. turn the carbohydrates into sugar

8. Which of the following gives energy to the body?
   a. minerals
   b. vitamins
   c. carbohydrates
   d. iron

9. A candy bar is which of the following:
   a. a poor source of vitamins and minerals
   b. a high source of vitamins and minerals
   c. a poor source of carbohydrates
   d. none of the above

10. Nutrients are
    a. all the carbohydrates in a food such as sugars
    b. all the parts of a food such as vitamins, minerals, proteins, fats, and carbohydrates
    c. all the protein that is found in a food
    d. none of the above

11. Sugar is also known as
    a. protein
    b. fat
    c. vitamin
    d. none of the above

12. A candy bar has
    a. more carbohydrates than a potato
    b. less carbohydrates than a slice of bread
    c. less carbohydrates than a potato
    d. none of the above

13. A banana has
    a. more carbohydrates than a potato
    b. more carbohydrates than a slice of bread
    c. less carbohydrates than a slice of bread
    d. none of the above
14. One of the things that vitamins and iron do for you is that they
   a. make you fat
   b. turn carbohydrates into protein
   c. turn fat into carbohydrates
   d. help deliver oxygen throughout the body

15. What do carbohydrates do for your body?
   a. they supply protein to the body
   b. they supply fat to the body
   c. they supply vitamins and minerals to the body
   d. they supply energy to the body

16. If you wanted plenty of vitamins and iron, which of the following would you want to
    eat?
   a. a candy bar
   b. fruits, vegetables, bread and cereals
   c. lots of sugar
   d. none of the above

17. Which of the following meals would be best for a runner to eat several hours before a
    race?
   a. a chocolate bar and a glass of water
   b. a slice of bread and a glass of water
   c. a potato and a glass of water
   d. a potato, some fruit and vegetables, and a glass of water

18. Sugar is also known as a…
   a. fat
   b. carbohydrate
   c. protein
   d. all of the above

19. How many carbohydrates does a slice of bread have?
   a. 2 grams of carbohydrates
   b. 10 grams of carbohydrates
   c. 50 grams of carbohydrates
   d. 90 grams of carbohydrates

20. How many carbohydrates does a regular candy bar have?
   a. no grams of carbohydrates
   b. 2 grams of carbohydrates
   c. 5 grams of carbohydrates
   d. none of the above
APPENDIX B
NARRATIVE VIDEO SCRIPT
“Graham and the Carbohydrate”
Shooting Script

INT: SPACESHIP

GRAHAM, a 10 year old, is in the backseat, passenger side. GARRET, a 3 year old, also in the back, is on the driver’s side. MOM is in the driver’s seat. Through the windshield we see stars in the distance.

Mom
Do you have your lunch, Graham?

Graham
Got it.

Mom
Remember, if you play kickball during recess, no sliding into the base.

Graham
But, they’ll throw me out then, Mom.

Mom
Better they throw you out than have all your pants with holes in them.

Graham sighs.

Mom
Understood?

Graham
Understood.

The ship approaches an earthlike planet and then descends upon a futuristic building. It lands on a circular platform. Graham steps out. Garret is watching him intently.

Garret
Bye Graham.

Graham
Bye Garret.
Mom
Have a nice day.

Graham
You too, Mom.

INT: SCHOOL – DAY
Graham runs in and is greeted by his good friend RONI. She waves as he approaches.

Graham
Hey, Roni.

Roni
Hi, Graham. You do your math homework?

Graham
Yep, it was easy.

They turn and walk down a corridor into the school.

Roni
If we play kickball today, let’s try to be on the same team again.

Graham
OK.

INT: SCHOOL HALLWAY – DAY
Graham and Roni walk through an opening. They are greeted immediately by EVAN and JACKSON, who have been waiting for them. Evan is a very slender 10 year old with red hair, and Jackson is an 11 year old.

Jackson
There he is.

Evan and Jackson approach Graham and Roni.

Jackson
You finish your math problems?

Graham
Yep.
Jackson
(looking at Evan)
I told you. He always gets ‘em done.

They all walk together down a hallway.

Evan
(to Graham)
Can you show me how you got the answer to number eight?

Roni
I’ll show you.

Evan
(tactfully)
I want to see Graham’s too though. He usually gets ‘em right.

Graham
I’ll show you at lunch. The bell is about to ring.

They round a corner and Roni gets an immediate look of horror.

Roni
Oh no! There’s Calvin.

Jackson
Quick, let’s go the other way, before he sees us.

It is too late. CALVIN, a very large 12 year old, sees the group and his eyes light up with mischief. He is standing in a crowd of rough looking boys who all seem to have their attention on him. He starts toward Graham and the others.

Calvin
Well lookie here.

Evan
(to himself)
I don’t need this today.

Calvin
So where do you losers think you’re going?

Roni
Just ignore him and maybe he’ll go away.
The group tries to walk past Calvin, but he hops in front of them and blocks their path. He positions himself in front of Graham.

Calvin  
You do my homework for me, lame brain?

Graham  
I did my homework.

Calvin  
Then I guess you better give me your homework, then.

Roni  
Don’t do it, Graham. You’ll get a zero from Mr. Marsh.

Calvin grabs Graham by the shirt and pulls him close. The difference in their size is evident. Calvin jerks Graham up so that he has to stand on his toes.

Calvin  
Listen, lame brain. You better give me that homework or your Momma ain’t gonna recognize you when I’m done with you.

Calvin raises his fist and puts it up near Graham’s face. Graham slowly reaches behind him, into his back pack, and produces a small disc. He hands it to Calvin.

Calvin  
Now that’s more like it.

He glances quickly at it. He smiles to himself.

Roni  
Can we go now?

Calvin doesn’t answer, but waves them off with his hand. The group seizes the opportunity for escape and hurries along.

Roni  
You should tell Mr. Marsh that he has taken your homework twice now.

Graham  
That’s OK. I have a little surprise for Calvin.

Graham reaches into his backpack and produces another disc. The others give him a puzzled look.
Graham
This is my homework. The one I gave Calvin doesn’t have a single right answer on it.

It takes a second for this to register, but when it does the others all have a good laugh. They continue laughing as they head into their classroom.

INT: CLASSROOM – DAY

The class is set up with tables instead of desks. Four children are seated at four different tables. Graham, Roni, Evan, and Jackson all sit at the table by the window. At the front of the class is MR. MARSH, the teacher.

Jackson
I wonder what we’re gonna do for science today.

Evan
More nutrition, I guess.

Jackson
Hey, maybe we’ll get to eat something good.

Graham
Or maybe we’ll have to eat something bad.

Jackson gives Graham a goofy look.

Jackson
Think positive. Think chocolate chip cookies.

Graham
That’s not positive. That’s dreaming.

At this moment Calvin walks in with a couple of his buddies. They go to the table farthest away from the front of the class and sit down. Calvin looks across the room and gives Graham a sarcastic smile. Calvin’s buddies laugh. Graham just smiles back. The bell rings.

Mr. Marsh
Alright, class, today we are going to continue learning about nutrients. Can anyone tell me what a nutrient is?

No one raises their hand. Mr. Marsh waits a couple seconds.

Mr. Marsh
Evan, can you tell me what a nutrient is please?
Evan sits up in his seat. His response is more like a question than an answer.

Evan
A nutrient is what food is made of?

Mr. Marsh
Well, that’s part of it. Can anyone else tell me something more about nutrients?

Roni raises her hand.

Mr. Marsh
Yes, Roni.

Roni
Nutrients are the parts of food like protein, fat, sugar, and vitamins.

Mr. Marsh
That’s right. Protein, fats, sugars, vitamins, minerals, and carbohydrates are all nutrients. Today we are going to learn about carbohydrates. Carbohydrates are our number one source of energy.

One of the boys at Calvin’s table raises his hand.

Mr. Marsh
Yes, Lloyd.

Lloyd
Does a candy bar have carbohydrates?

Mr. Marsh
Carbohydrates. Yes, a candy bar is very high in sugar, which is a carbohydrate.

Mr. Marsh walks over to the large box that is on his desk and begins to open it.

Mr. Marsh
I have an exciting activity for us today that will help us learn all about carbohydrates.

He pulls several glasslike containers from the large box. In each of these containers there is a small creature that resembles a lizard. They have long rear legs and are a greenish
brown. Calvin looks at the creatures from his table and then gives Graham a devilish looking glance. Graham doesn’t see this.

Mr. Marsh
These are begosaurs, a creature from the planet Begonia. They are very much like reptiles on this planet, except that they are very sensitive to food. You see, when we eat food, it usually takes hours for us to see how that food has affected us. And the visible results of our eating habits can take hours or days to show up on our bodies. Begosaurs are different. Food has an almost instant effect on them, and results that take hours and days for us only take minutes for them.

Mr. Marsh holds up one of the jars so everyone can see the begosaur clearly. The begosaur sits calmly in the container. Mr. Marsh then sets the container on the table closest to him.

Mr. Marsh
Would one person from each table come up here to my desk and get a begosaur for your group?

Several kids make their way to the front of the class. Calvin goes for his table and Jackson goes for his table. At the front of the class Calvin slyly butts in front of the others and gives a dirty look to Jackson. He then grabs the biggest begosaur quickly.

Calvin
We want this big one.

Mr. Marsh sees this, but doesn’t say anything. He is too busy pulling other items out of the large box. The rest of the kids return to their tables with the begosaurs and sit down.

Mr. Marsh
What we are going to do with these begosaurs in a little while is we are going to have a race. I am going to give each table a bag of food items. It is your job to feed your begosaur the best foods so that it will have plenty of energy for the race.

Mr. Marsh walks around the room giving each table a bag of food items.

Calvin (to his table)
This is a cinch. Just you watch. They don’t stand a chance.

Calvin keeps his eye on Graham’s table. His eyes sparkle as though he is up to something.
Mr. Marsh
You will need to use your research tools to find out which of the foods in the bags will help your begosaur get energy. Keep in mind that carbohydrates are found in many foods, and some foods have more of it than others.

Once Calvin gets his bag he immediately opens it and dumps the contents on his table. He quickly grabs the candy bar.

Calvin
(excitedly)
Yes!

Roni dumps the bag out onto Graham’s table and begins spreading the food items about. A candy bar is singled out to the side. Calvin zeros in on this. The rest of Graham’s table is sorting out the foods. There are apples, bananas, bread, cereal, potatoes, noodles, etc.

Evan
This sure is a lot of food for this little guy.

Mr. Marsh hears this.

Mr. Marsh
You don’t want to give all of the food to your begosaur. You should decide which foods will help it have the most energy. You may want to give several foods to it, in which case you could give it a piece of one food and a piece of another.

Several of the kids get up to go and get their research tools from a shelf at the front of the class. Evan goes for Graham’s table and Calvin goes for his. On his return trip to his table, Calvin walks by Graham’s table and reaches out and grabs their candy bar. Roni sees this.

Roni
Hey! What are you doing?

Calvin leans into their table and whispers.

Calvin
Say anything and I’ll pulverize you after school.
The others at the table are quiet, obviously afraid of standing up to Calvin. Calvin, satisfied they aren’t going to do anything about it, smiles and continues on to his table. Roni is visibly angry.

Roni
I’m going to tell Mr. Marsh.

Graham
No, don’t. It’s OK.

Roni calms down slightly.

Roni
It’s just not fair what he gets away with.

Graham
He hasn’t gotten away with it yet.

Evan returns with the research tool.

Graham
C’mon, lets get started.

Evan switches on the research tool, which flickers on and shows a screen. Evan speaks into it.

Evan
We want to know how much energy is in the food we have on the table.

Research Tool
Name the food.

Graham and Roni each pick up a piece of food. Graham picks up a potato and Roni picks up an apple. They both speak at the same time.

Roni
An apple.

Graham
A potato.

Research Tool
Please specify which food.

Graham and Roni look at each other.
Roni
I think we should try the apple first, cause it’s sweet, which means it has more sugar in it, and sugar is a carbohydrate.

Jackson
Calvin got the food with the most sugar in it.

They all look over at Calvin’s table. Calvin and his buddies are feeding the first of the two candy bars to the Begosaur, who chomps it down eagerly. Calvin seems quite content with himself.

Jackson
It’s no use trying to win.

Graham
I don’t think it will be that easy. With Mr. Marsh there is always more to it.

Evan
I think your right. Let’s see how many carbohydrates are in these other foods.

They each take turns naming the foods for the research tool.

Roni
Apple.

Research Tool
A raw apple has twenty one grams of carbohydrates.

Jackson
A slice of bread.

Research Tool
A slice of bread has ten grams of carbohydrates.

Evan
A banana.

Research Tool
A banana has twenty six grams of carbohydrates.

Graham
A potato.
Research Tool
A medium sized potato has 51 grams of carbohydrates.

Graham
Let’s put the food in a line. The food with the most carbohydrates can be
at this end, near Roni, and the food with less carbohydrates can go at
Evan’s end of the table.

They align the foods across the table. Evan keeps on getting the carbohydrate counts of
each of the foods as they do this.

DISSOLVE TO:

All four kids are standing at the table, staring at their long line of food. At one end are the
potato, bread, bagel, and fruits, while at the other end are the vegetables like a carrot, a
tomato, and a cucumber.

Graham
(to the research tool)
What is the total number of carbohydrates of all the foods we have in this
line?

Research Tool
The total amount of carbohydrates for all the foods present on the table is
two hundred and ten grams.

Roni
That is a lot of carbohydrates.

Evan
(to the research tool)
How many carbohydrates are in one candy bar?

Research Tool
There are thirty three grams of carbohydrates in one medium candy bar.

They all look at each other.

Roni
We don’t need a candy bar.

They all look over at Calvin’s table. Calvin is just about done feeding his begosaur the
second candy bar. The begosaur has slowed down considerably his eating. It has the look
of being full. Calvin looks up and sees the table looking at him. Calvin smiles.
Evan
(under his breath to the others)
That kid really bugs me.

They all turn their attention back to the food on the table.

Roni
It doesn’t really matter, cause the potato has more carbohydrates than the candy bar anyway. We should see if we can get the begosaur to eat the whole potato.

Graham
I think we should think about it first. Maybe the begosaur needs more than just carbohydrates.

Jackson
Ask the research tool.

Graham
Good idea.

Graham walks around to stand next to Jackson.

Graham
(to the research tool)
Do bodies need more than carbohydrates for energy?

Research Tool
Carbohydrates supply energy to the body, but in order for the body to burn this energy it requires oxygen. Vitamins and iron are necessary for the body to deliver oxygen to the muscles so that carbohydrates can be used for energy.

Graham
(to the research tool)
Which of the foods on the table has the most iron and vitamins in it?

Research Tool
A variety of foods such as fruits, vegetables, bread, and cereals are required to get the right amount of iron and vitamins.

Roni
(to the research tool)
Does a candy bar have these vitamins and iron?
Research Tool
A candy bar is very high in carbohydrates, but is a poor source of vitamins and iron.

The group looks at Calvin’s begosaur, which seems a little fatter than it was earlier. It also seems to be a little lethargic. The group’s mood seems to lighten somewhat.

Graham
What we need to do is give the begosaur a little bit of everything, so it gets plenty of vitamins.

Evan
We better hurry, all the other tables are already feeding their begosaurs.

They begin feeding the begosaur. Roni picks up a slice of bread and tears off a piece. She drops it into the container holding the begosaur. The begosaur eagerly begins to devour it.

Jackson
Let’s give it some apple next.

DISSOLVE TO:

Mr. Marsh walks about the classroom.

Mr. Marsh
It is time to stop feeding your begosaurs. Begin cleaning up your table, putting the extra food back into the bags.

The class bustles about, cleaning up the tables.

Mr. Marsh
Now, I would like you to grab the containers with your begosaurs and everyone line up at the front of the classroom.

The class does this and lines up. Calvin winds up next to Graham, but he doesn’t seem to be as confident as he was earlier. He gives Graham a shove that almost knocks Graham down. Graham doesn’t react.

Mr. Marsh
We are going to let our begosaurs race from one end of the classroom to the other.

Mr. Marsh stands in front of the line.
Mr. Marsh
Would someone from each table bring you begosaur up here to me?

Roni brings the begosaur up front, and so does Calvin for his table. They stand in front of Mr. Marsh, waiting for his instructions. Mr. Marsh holds up what appears to be a clump of grapes. He holds them up in front of the containers that hold the begosaurs. All of the begosaurs seem to become excited, except for Calvin’s. Calvin’s begosaur seems rather plump now.

Mr. Marsh
What I have here is a very special treat for begosaurs. These are stubble berries from the home planet of these begosaurs. They are the favorite food of begosuars, but they are hard to find. I expect that these begosaurs will run as fast as they can to get to these berries.

Roni
But won’t our begosuars not want to eat because they are full of the food we have been giving them?

Mr. Marsh
Begosaurs are always hungry for stubble berries, no matter how much food they have eaten. Hopefully, you have given your begosaurs the right types of food, so that they will have plenty of energy for running.

The begosaurs go crazy trying to get out of their containers and get the stubble berries. That is, all except for Calvin’s, which seems even more lethargic and plump than before. Mr. Marsh puts the stubble berries in the large container at the other side of the classroom.

Mr. Marsh
I am going to count to three and then I want you to turn your begosaur loose. The table with the begosaur that reaches the stubble berries first will be declared the winner.

Evan
Look at how big Calvin’s begosaur has gotten.

Graham
Yeah, I don’t think it is in the mood to race. Looks like it wants to take a nap.

Mr. Marsh
One. Two. Three!
All of the six kids fling open the doors and the begosaurs spring out. Graham’s table’s begosaur bounds across the room with two others close behind. Calvin’s is very slow getting out of the container. Graham's begosaur establishes a lead and reaches the berries first with the other two not too far behind. It takes a little longer for Calvin's begosaur to finally reach the stubble berries. It hobbles up to them as Mr. Marsh puts a box over them.

Calvin
They gave us a bad one. It’s too lazy to race.

Roni
It wasn’t bad until you gave it two candy bars.

Calvin
Oh, be quiet.

Mr. Marsh
Graham, since your table’s begosaur won the race, why don’t you tell us what you fed him.

Graham
We fed him a little bit of everything. The research tool told us that even with lots of carbohydrates, you still need vitamins and other nutrients to use the energy in carbohydrates.

Mr. Marsh
That’s right. Carbohydrates do have lots of energy in them, but we need the other nutrients to make use of them.

Mr. Marsh looks at Calvin.

Mr. Marsh
What did you feed your begosaur, Calvin?

Calvin
A candy bar.

Roni
Two candy bars.

Calvin gives her a dirty look.

Mr. Marsh
I never intended for you to have two candy bars in your bag, I must have miscounted.
Graham, Evan, and Roni look at each other quietly.

Mr. Marsh
Oh well, it is a good lesson of what not to eat. Too many carbohydrates in the form of sugar can be too much for the body, which turn the extra carbohydrates into fat. And candy bars are low in vitamins. So not only did Calvin’s begosaur not get the needed vitamins from the candy bar, but it turned all the extra energy into fat.

Calvin looks dejected.

Mr. Marsh
Okay, class, line up at the door. We are going outside for some kickball.

Calvin gets in right behind Graham.

Calvin
Wait ‘till we get outside. You’re gonna pay for this, lamebrain.

Mr. Marsh approaches Calvin.

Mr. Marsh
Oh Calvin, I need for you to sit with me while the class plays kickball. It seems that all your homework problems are wrong, so I would like for you to explain how you solved them.

Roni, Graham, and Evan face forward and smile. Roni is in the back of the other two.

Roni
Serves him right.

Graham
Remember, let’s be on the same team.

Roni
Right.

Mr. Marsh
Okay class, let’s go.

They all begin marching out the door.
“A Classroom in the Future”
Shooting Script

INT: CLASSROOM – DAY

The class is set up with tables instead of desks. Four children are seated at four different tables. GRAHAM, RONI, EVAN, and JACKSON enter and all sit at the table by the window. At the front of the class is MR. MARSH, the teacher.

Jackson
I wonder what we’re gonna do for science today.

Evan
More nutrition, I guess.

Jackson
Hey, maybe we’ll get to eat something good.

Graham
Or maybe we’ll have to eat something bad.

Jackson gives Graham a goofy look.

Jackson
Think positive. Think chocolate chip cookies.

Graham
That’s not positive. That’s dreaming.

At this moment CALVIN walks in with a couple of his buddies. They go to the table farthest away from the front of the class and sit down.

Mr. Marsh
Alright, class, today we are going to continue learning about nutrients. Can anyone tell me what a nutrient is?

No one raises their hand. Mr. Marsh waits a couple seconds.

Mr. Marsh
Evan, can you tell me what a nutrient is please?
Evan sits up in his seat. His response is more like a question than an answer.

Evan
A nutrient is what food is made of?

Mr. Marsh
Well, that’s part of it. Can anyone else tell me something more about nutrients?

Roni raises her hand.

Mr. Marsh
Yes, Roni.

Roni
Nutrients are the parts of food like protein, fat, sugar, and vitamins.

Mr. Marsh
That’s right. Protein, fats, sugars, vitamins, minerals, and carbohydrates are all nutrients. Today we are going to learn about carbohydrates. Carbohydrates are our number one source of energy.

One of the boys at Calvin’s table raises his hand.

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Yes, Lloyd.

Lloyd
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These are begosaurs, a creature from the planet Begonia. They are very much like reptiles on this planet, except that they are very sensitive to food. You see, when we eat food, it usually takes hours for us to see how that food has affected us. And the visible results of our eating habits can take hours or days to show up on our bodies. Begosaurs are different. Food has an almost instant effect on them, and results that take hours and days for us only take minutes for them.

Mr. Marsh holds up one of the jars so everyone can see the begosaur clearly. The begosaur sits calmly in the container. Mr. Marsh then sets the container on the table closest to him.

Mr. Marsh
Would one person from each table come up here to my desk and get a begosaur for your group?

Several kids make their way to the front of the class. Calvin goes for his table and Jackson goes for his table. The kids return to their tables with the begosaurs and sit down.

Mr. Marsh
What we are going to do with these begosaurs in a little while is we are going to have a race. I am going to give each table a bag of food items. It is your job to feed your begosaur the best foods so that it will have plenty of energy for the race.

Mr. Marsh walks around the room giving each table a bag of food items.

Mr. Marsh
You will need to use your research tools to find out which of the foods in the bags will help your begosaur get energy. Keep in mind that carbohydrates are found in many foods, and some foods have more of it than others.

Once Calvin gets his bag he immediately opens it and dumps the contents on his table. Roni dumps the bag out onto Graham’s table and begins spreading the food items about. The rest of Graham’s table is sorting out the foods. There are apples, bananas, bread, cereal, potatoes, noodles, etc.

Graham
There is no candy bar.

He looks over at Calvins table.
Graham
They have two candy bars.

They all look at the other table.

Evan
This sure is a lot of food for this little guy.

Mr. Marsh hears this.

Mr. Marsh
You don’t want to give all of the food to your begosaur. You should decide which foods will help it have the most energy. You may want to give several foods to it, in which case you could give it a piece of one food and a piece of another.

Several of the kids get up to go and get their research tools from a shelf at the front of the class. Evan goes for Graham’s table and Calvin goes for his. Evan returns with the research tool.

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C’mon, lets get started.

Evan switches on the research tool, which flickers on and shows a screen. Evan speaks into it.

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We want to know how much energy is in the food we have on the table.

Research Tool
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They align the foods across the table. Evan keeps on getting the carbohydrate counts of each of the foods as they do this.

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Graham
(to the research tool)
What is the total number of carbohydrates of all the foods we have in this line?

Research Tool
The total amount of carbohydrates for all the foods present on the table is two hundred and ten grams.

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That is a lot of carbohydrates.

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Good idea.

Graham walks around to stand next to Jackson.

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All of the six kids fling open the doors and the begosaurs spring out. Graham’s table’s begosaur bounds across the room with two others close behind. Calvin’s is very slow getting out of the container. Graham's begosaur establishes a lead and reaches the berries first with the other two not too far behind. It takes a little longer for Calvin's begosaur to finally reach the stubble berries. It hobbles up to them as Mr. Marsh puts a box over them.

Mr. Marsh
Graham, since your table’s begosaur won the race, why don’t you tell us what you fed him.
Graham
We fed him a little bit of everything. The research tool told us that even with lots of carbohydrates, you still need vitamins and other nutrients to use the energy in carbohydrates.

Mr. Marsh
That’s right. Carbohydrates do have lots of energy in them, but we need the other nutrients to make use of them.

Mr. Marsh looks at Calvin.

Mr. Marsh
What did you feed your begosaur, Calvin?

Calvin
A candy bar.

Roni
Two candy bars.

Calvin gives her a dirty look.

Mr. Marsh
I never intended for you to have two candy bars in your bag. I must have miscounted.

Graham, Evan, and Roni look at each other quietly.

Mr. Marsh
Oh well, it is a good lesson of what not to eat. Too many carbohydrates in the form of sugar can be too much for the body, which turn the extra carbohydrates into fat. And candy bars are low in vitamins. So not only did Calvin’s begosaur not get the needed vitamins from the candy bar, but it turned all the extra energy into fat.

Calvin looks dejected.

Mr. Marsh
Okay, class, line up at the door. We are going outside for some kickball.

Graham
Remember, let’s be on the same team.
Roni

Right.

Mr. Marsh

Okay class, let’s go.

They all begin marching out the door.
APPENDIX D
INFORMED CONSENT
I am pleased to advise you that the University of Florida Institutional Review Board has recommended approval of this protocol. Based on its review, the UFIRB determined that this research presents no more than minimal risk to participants. Given your protocol, it is essential that you obtain signed documentation of informed consent from the parent or legal guardian of each participant. When it is feasible, you should obtain signatures from both parents. Enclosed is the dated, IRB-approved informed consent to be used when recruiting participants for the research.

It is essential that the parents/guardians of your minor participants sign a copy of your approved informed consent that bears the IRB stamp and expiration date.

If you wish to make any changes to this protocol, including the need to increase the number of participants authorized, you must disclose your plans before you implement them so that the Board can assess their impact on your protocol. In addition, you must report to the Board any unexpected complications that affect your participants.

If you have not completed this protocol by February 3, 2005 please telephone our office (392-0433), and we will discuss the renewal process with you. It is important that you keep your Department Chair informed about the status of this research protocol.

IF:dl
Dear Parent/Guardian,

I am a graduate student in the School of Teaching and Learning at the University of Florida, conducting research on knowledge gains from different forms of instruction under the supervision of Dr. Lee Mulhally. The purpose of this study is to compare a student's knowledge gains from watching a video on nutrition under two different conditions, one video will present nutrition information in a narrative or story format and the other will present nutrition information in a more expository, non-story type of format. The results of the study may help teachers and producers of educational materials to better understand the amount of knowledge gained from these formats and assist them in designing instructional practices and materials. These results may not directly help your child today, but may benefit future students. With your permission, I would like to ask your child to volunteer for this research.

Half of the participating children will view the nutrition video that is in a narrative/story form, while the other children will view the nutrition video in a non-story form. Both videos have been prepared specifically for this research and contain information about nutrients, carbohydrates, and the importance of a well-balanced diet. Children will be asked to complete a 20 item, multiple choice test, before and after viewing the video, and then one week later. This test is designed to measure the amount of knowledge they gained from the videos, but children will not be required to answer any question they do not wish to answer. Student scores on the narrative portion of the Florida Writes exam will be compared with performance on the nutrition test to determine whether narrative writing ability affects the teaching strategy used in the video. The procedure will be presented by me, under supervision of your child's teacher during the normal class period. The test will take students approximately 15 minutes to complete. The videos are approximately 20 minutes in length. The procedure will occur in the months of March and April. Although the children will be asked to write their names on the test for matching purposes, their identities will be kept confidential to the extent provided by law. We will replace their names with code numbers. Results will only be reported in the form of group data. Participation or non-participation in this study will not affect the children's grades or placement in any programs.

You and your child have the right to withdraw consent for your child's participation at any time without consequence. There are no known risks or immediate benefits to the participants. No compensation is offered for participation. Group results of this study will be available in May upon request. If you have any questions about this research protocol, please contact me at 495-2739 or my faculty supervisor, Dr. Mulhally, at 392-0705 extension 259. Questions or concerns about your child's rights as research participant may be directed to the UFIRB office, University of Florida, Box 112250, Gainesville, FL 32611, (352) 392-0433.

George Hack

I have read the procedure described above. I voluntarily give my consent for my child, ________________, to participate in George Hack's study of knowledge gains in instructional videos. I have received a copy of this description.

Parent / Guardian

Date

2nd Parent / Witness

Date
LIST OF REFERENCES


Maria, K., & Junge, K. (1993, December). A comparison of fifth graders' comprehension and retention of scientific information using a science textbook and an informational storybook. Paper presented at the meeting of the National Reading Conference, Charleston, SC.


BIOGRAPHICAL SKETCH

George Hack holds a bachelor’s degree in English and a master’s degree in education from the University of Florida. Before entering the doctoral program he spent 5 years working in the University of Florida’s Institute of Food and Agricultural Sciences as coordinator of nutrition education programs. Prior to that he served as Director of Education and Training for Wackenhut Educational Services.

George has served ten years in the military, with four years of active duty in the Marine Corps. He has taught in a variety of environments, including secondary, undergraduate, graduate, adult vocational training, and military schools.

George has been married to his wife, Susan, for thirteen years, and they have two sons, Graham and Garret.